Rock Products

With which is Incorporated CEMENT and ENGINEERING NEWS

Founded 1896

Chicago, June 13, 1925 (Issued Every Other Week) Volume XXVIII, No. 12

MEMBER A.B.C. *The Only Paid Circulation in this Industry* MEMBER A.B.P.

Printing of This Issue Is 5300 Copies. Next Issue Will Be June 27

Eliminating press breakage!

THE Sand Lime Products Co. of Detroit has found the way to eliminate press breakage—a Dings High Intensity Magnetic Pulley is on guard, turning aside the tramp iron.

There are two Dings Pulleys paying for themselves in this great plant. One protecting the brick presses and the other guarding the hammer mill. But read what Rock Products says—good reasons for your installing a Dings.

Dings Magnetic Separator Co.
803 Smith St., Milwaukee, Wis.

Dings *High Intensity* **MAGNETIC SEPARATION**

From Rock Products April 18

...brick bats int... ...od mill ...
of coarse material coming out.

From the rod mill the mixture is conveyed by short belt conveyor over a Dings magnetic pulley to a bucket elevator. There has been no screening of raw materials at any point in the process. Tramp iron has always been a source of trouble and has only been eliminated by the use of a magnetic pulley. The company claims that the sale of the scrap iron removed will some day pay for the pulley. The saving in press breakage has paid for the pulley several times over, although it has been in use only for about 10 months to date.

From the magnetic pulley to the finished product there is nothing particularly new or novel. The mix is elevated by a bucket elevator to a point about 15 ft. above the top of the presses. It divides into two chutes leading to a platform over the presses. The piles to a platform feed down by gravity into the press. The two presses used are of the vertical type with a capacity of 3000 brick per hour. Each brick is stamped with he name of the company.

The pressure and mixture elevator remain

Dings Pulley catching tramp iron at press

Brick press under Dings protection

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Rock Products
CEMENT and ENGINEERING NEWS

Volume XXVIII | Chicago, June 13, 1925 | Number 12

Charles Warner Again President of the National Lime Association

Seventh Annual Convention of the Association at Briarcliff, New York, a Most Successful One

IN answer to the unanimous appeal of the American lime industry, supplemented by the persistent personal efforts of its leaders, Charles Warner, president of the Charles Warner Co., and the American Lime and Stone Co., Wilmington, Del., has been persuaded to again take the presidency of the National Lime Association.

As every lime manufacturer knows, this office is not and never has been a sinecure; it calls for a great deal of time, energy and work. George B. Wood, president of the Rockport and Rockland Lime Corp., Rockland, Me., who has served as president so unselfishly and so efficiently the past two years, declined re-election on the ground that he could not longer devote the time to the office that it has been found by all incumbents to require.

President Warner's remarks on assuming the chair were brief. Nevertheless, they showed a devotion to the cause of the lime industry such as has few parallels in industrial history. It is peculiarly fitting that Mr. Warner should be president for the next two years. This period will undoubtedly see the fruition of the Association's work on quick-setting plaster and lime building block, inaugurated under Mr. Warner's previous administrations, and carried forward under President Wood.

Charles Warner, President of the National Lime Association

J. J. Urschel, president of the Woodville Lime Products Co., Toledo, Ohio, was elected vice-president. The directors, elected by the members in each district are as follows: District No. 1, Geo. B. Wood, adn J. M. Deely, president of the Lee Lime Co., the Connecticut Lime Co., and the Tobey Lime Co., Lee, Mass.; District No. 2, Geo. R. LeGore, secretary of the LeGore Lime Co., LeGore, Md., and Lowell M. Palmer, president of the Palmer Lime and Cement Co., York, Penn.; District No. 3, Charles Warner; District No. 4, William E. Carson, president of the Riverton Lime Co., Riverton, Va.; District No. 5, J. J. Urschel, and E. C. Swessinger, sales manager, Kelley Island Lime and Transport Co., Cleveland, Ohio; District No. 6, Morgan Curtis, president of the Northern Stone and Lime Co., Petoskey, Mich.; District No. 7, Col. C. W. S. Cobb, president of the Glencoe Lime and Cement Co., St. Louis, Mo., and Bernard L. McNulty, president of the Marblehead Lime Co., Chicago; District No. 8, R. C. Brown, vice-president of the Western Lime and Cement Co., Milwaukee, Wis.; District No. 11, J. M. Gager, treasurer and general manager of the

Gager Lime and Manufacturing Co., Chattanooga, Tenn.; District No. 12, J. F. Pollock, vice-president, Ash Grove Lime and Portland Cement Co., Kansas City, Mo.; District No. 13, H. Dittlinger, president of the Dittlinger Lime Co., New Braunsfels, Tex.; District No. 14, John S. McMillin, president of the Tacoma and Roche Harbor Lime Co., Seattle, Wash.

The most important subjects considered at the convention were the projects for a quick-setting lime plaster and the commercial introduction of lime building block and tile. Much progress has been made in the

Geo. B. Wood,
President, National Lime Association, 1923-1925

last year by the association in the development and perfection of these lime products. Both projects are nearly at the stage of commercial application.

Address of President George B. Wood

THERE comes a time in the life of almost every man when he stops to take account of stock. He senses the fact that he may be living in a rut and the time is opportune to make a change. His mental analysis will possibly be like this: "Why have I not progressed? What is there new in my life the past few years? What have I done, like other men have done, to add my bit of helpfulness to myself and my fellow men, I certainly am in a rut."

Those who continue to live in ruts are mostly men who lack imagination, who accept things as they are and care little for tomorrow. List the rut-livers of your acquantaince and you will recognize them all as men who live a humdrum, self centered life and seldom mingle with their fellows.

What is true of individuals is equally true of commercial institutions. Some manufacturing concerns are rut-livers. Seldom do you find them mingling with their fellow manufacturers, seldom do you find their business sphere expanding. We as mortal beings must recognize the tragedy of old age always drawing nearer, but to my mind there is far more tragedy to the spectacle of a manufacturing concern dying a lingering death during this age of progress and opportunity.

"Perpetual Youth for Industrial Organizations"

We have no hope of perpetual youth for ourselves, but the lime company whose fortunes we guide has an opportunity to grow larger and stronger and even younger as years of progress pass by. This opportunity is not for the rut-liver, but only for the alert and inquisitive, for those broad minded business organizations who make it their business to gather knowledge from every source and to mingle with their fellow manufacturers.

None can hope to accomplish by single minded effort that which all of us can create by co-operative effort. We must recognize the fundamental need of a trade association such as ours. Our business of lime burning is many centuries old, but we cannot claim that it has yet reached the stage entitled to be called a perfected art. We are still very young in our experience with modern association work, but we have definitely emerged from the incubation period and during these first six years of our Association's existence there has been more true constructive progress in our industry than in perhaps any dozen years of its previous history. We have ceased to be an industry composed of rut-livers. We may well be proud of our accomplishments of the past and confident of those of the future.

Energy Co-ordinated and Non-Co-ordinated

I recently read a most scholarly address delivered by Arthur G. Staples to the Rotary Club of Lewiston, Maine. A part of it reads as follows:

"There are two kinds of energy or service in the universe—co-ordinated and non co-ordinated.

"In a recent article by Michael Pupin, one of these kinds of energy or service is called Chaos and the other is called Cosmos.

"Chaos is energy, service, motion without control or direction. Cosmos is energy or service translated into a purpose, a cosmos.

"A familiar example of the two forms of energy or service is steam and the steam engine. Steam is non-co-ordinated energy-atoms of power. When it escapes, it explodes and kills. Steam in its raw state is power as we call it non-co-ordinated energy. The steam engine takes the steam and transforms it into working power; it co-ordinates all of its bombarding atoms into orderly procession. It puts it to a definite use. It turns wheels; it does work for man. The steam engine is co-ordinated power. It is cosmos from chaos.

Is not that after all the main purpose of all human effort. To co-ordinate in co-ordinated energy into a form which will be useful and of service to civilized humanity?

Viewed in this age of progress, an industry still following its individual nose without the co-operative effort of a national trade association is to my mind a typical condition of futile energy, of waste steam, still better described as chaos.

Many Unsolved Problems

There are still ahead of us many unsolved problems in our industry, many unco-ordinated facts yet to be co-ordinated. What we have already accomplished should only be an added incentive for further and more orderly effort in the future. It should also be an incentive to all lime manufacturers, even the worst of rut-livers, to join our membership and add their additional bit of helpfulness to our united effort.

Let us be proud of the accomplished purpose of our Association. We are most cer-

J. J. Urschel,
Elected Vice-President, National Lime Association

tainly leading the lime industry from a condition of chaos to cosmos.

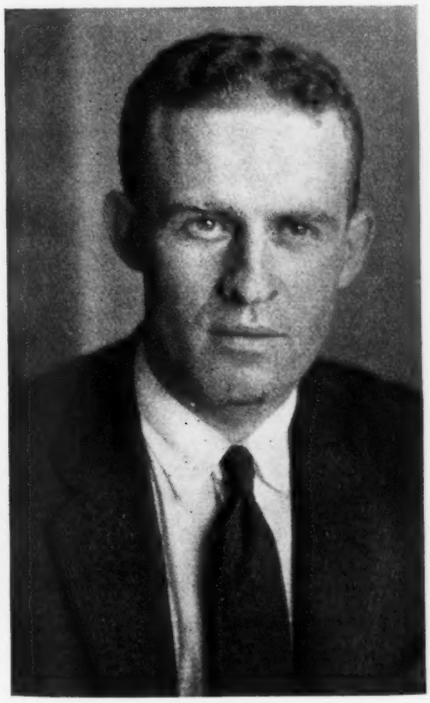
Like most good things, modern association work costs money. Our financial resources are more modest than they well might be. Our membership lacks many who well might join with us in our undertaking. But we are still young and are growing each suc-

ceeding year. None of us in attendance at this Convention are rut-livers. We would not be here if we were. Avoid the thought that you are a guest. This is your Association and your Convention. Active criticism and constructive suggestion is the very foundation of true co-operation. It is my hope and sincere anticipation that the proceedings of this Convention will be an inspiration to us all.

Report of General Manager Burton A. Ford

TWO years ago, at the 1923 convention, the members of the National Lime Association obligated themselves to the payment of dues for the period ending June 30 next. At this time the staff of the Association is ready to report on what has been accomplished during this two-year commitment period.

I shall not attempt to make such a report at this moment but prefer to have the present convention be the means of making this report. In other words, the program has been so arranged as to allow each member of the staff to report on his own particular department and in addition space has been allotted to the two major problems on which



General Manager Burton A. Ford

we have been working for the past two years. I am, of course, referring to the quick-set lime plaster and the lime building block. Likewise there will be addresses on other matters and I desire to particularly call your attention to two subjects which are fast becoming important to the lime industry, namely, the lime treatment of trade waste, which was presented in a preliminary way last year and will be treated further this morning, and the subject of lime in asphalt, which will be presented on Friday morning by the most competent research engineer in the asphalt industry.

There has been a steady growth in membership during the past two years, there being at this time about 20 more members than on July 1, 1923. The membership reaches from the Atlantic to the Pacific and from Maine to Texas, and there is every reason to believe that this membership will continue to grow and become stronger each year.

The last year has most certainly been one of results and consequently we have strained every effort to take care of all of our problems, which has meant the spending of considerable money.

The general manager has at all times endeavored to carry out the policies as laid down by the membership and the board of directors, but I do ask at this time that the members realize how small a force of men is at work at Washington. It is only possible to attempt to accomplish a few things at a time. The policy of the board has always been to determine the most important work and to do that first. Please remember that at least one-half of your dues go to the maintaining of the offices, the payment of salaries, and other incidentals. Many thousands of letters are answered each year having to do with questions involving lime and at Washington has been collected a rather remarkable library on lime which is used to serve the industry in a general way. It is only with the other half of your dues that progressive research and technical work may be accomplished.

I am very glad to report that there is harmony between the Washington office and the divisions and the field men are aiding the headquarters staff in obtaining data which is used as the basis of bulletins and technical work. In conclusion I cannot help but say a word of praise for the very hearty co-operation of the Washington staff. We have fewer men than for the past several years but as co-operation and mutual help have been established as our unwritten rules of procedure, more work is being accomplished than ever before.

Annual Report of the Chemical Director, Dr. G. J. Fink

IN our report presented at last year's convention we outlined the different branches of the activities of the chemical division of the association and indicated the methods, extent and success of the efforts expended along these lines. We are gratified at this time to be able to report that your generous support has made it possible to continue all of these activities and to expand some of them in many directions. We should very much welcome the opportunity to recount in detail the work of the past year, but a full account of the various lines of effort and accomplishments would involve considerable repetition and more time than is at present available. Therefore we shall only briefly mention the more outstanding facts, trusting that most of you are sufficiently familiar with the headquarters activities to be able more or less to fill in between the lines.

Again this year, at last, we have found it advisable and necessary to spend the largest proportion of our time in construction research, which includes the larger problem of quicksetting plaster, which has already been reported upon in detail, and this has made it almost impossible to direct as much effort as we would like toward the other activities, which might be roughly grouped

Chemical Director Dr. G. J. Fink

under three heads, properties of limes, new uses and educational promotion.

Headquarters Laboratory

We are glad of the opportunity at this time to express to the members and to the management our appreciation of their generous response to our recommendation made last year that additional laboratory facilities be provided. The chemical department quarters have been rebuilt and enlarged, giving us ample space and what we consider excellent new equipment for the laboratory proper. This expansion has allowed us to isolate the plaster investigational work from the more strictly analytical and research activities.

We have been able to utilize the time of four men in the laboratory during most of the past year. The time of two of these has been given over exclusively to the quickset problem and one of these, our Mr. McCormick, was stationed at the plant of one of the manufacturers for a period of several months. A third man, Mr. Cabell,

has divided his time between the quickset work and the analytical work for members and divisions. A fourth man has been assigned to the laboratory at irregular intervals.

Service to Members

Requests from individual members and from the division organizations for analysis of limes, plasters, concretes, stuccos, waste by-products, and for control tests for determination as to whether products comply with A. S. T. M. requirements have taken practically the entire time of one man and this situation has helped more or less to sidetrack work which we have had outlined in connection with what we consider the more fundamental investigations, such, for example, as the completion of the work on properties of commercial limes. Over 40 complete analyses of plasters and concretes and about 35 complete analyses of limes and stones have been made. This is in addition to the large amount of analytical work required in connection with the plaster problem.

This leads us to remark that if this type of analytical service is to continue and to increase it should and must be especially provided for. Such service to member companies, we believe, should be made possible and there is no question but that it is essential to the proper functioning and efficiency of the headquarters promotion work and the division field activities.

Research

However, in spite of the increased demands on our time, Mr. Underwood and his men have at odd times been able further to develop certain methods of test and to devise certain new ones. Some time has been spent on methods for determination of available lime, carbon dioxide, free water, etc., and sufficient facts and data have been accumulated to justify the publication of a number of papers which will appear just as soon as we can find the opportunity to get them into proper form. A paper on available lime has been prepared and is soon to appear under the joint authorship of Dr. McIntire and Mr. Underwood.

Service to Consumers

Numerous questions arising in connection with various uses of lime have been answered and we have thereby been enabled to give very practical service to lime consumers.

The increase in requests from members and from users for information and help on manufacture and use has been very marked during the past year. Our office is being utilized as a clearing house for information on numerous manufacturing problems, fuel, proper methods for burning for particular uses, specifications for uses and suggestions for new fields.

Co-operation with Other Organizations —Fellowships

As you are already informed, the research and investigational work of the Association is divided between the headquarters laboratory and fellowships which are maintained in various educational and governmental institutions. Prof. Withrow of Ohio State University and Prof. Haslam at Mass. Institute of Technology, both have a number of men interested in lime problems in addition to the one man in each institution who is specifically assigned to the fellowship work.

At Ohio State University efforts have been concentrated on the problem of trade wastes and the work has been carried from the laboratory to the field, by means of which arrangement the fellowship man has been co-operating with plants in that vicinity and has observed and has advised in connection with installations using lime in the treatment of waste plant effluents. We have been somewhat unfortunate in connection with this fellowship work owing to the serious illness for several months of Mr. Ruhl, who has been conducting the work, but through the vigorous efforts of Prof. Withrow in assigning another man to full time on these problems definite accomplishments have resulted.

An investigation of the solubilities of commercial limes has been continued at the Massachusetts Institute of Technology and it has been found possible there to make definite practical application of a number of the facts developed. Prof. Haslam's connections with various industries using lime we feel has helped to make the results of the fellowship under his direction especially profitable to us. We are glad to have here for distributions, preprints of a paper on lime, which is to appear in the next issue of *Chemical and Metallurgical Engineering.*

At the Bureau of Standards, two major problems have been under way. Mr. Brown in his report will mention one of these which has more direct application to construction uses. The other problem we feel is of extreme importance and one which we believe holds promise of extremely valuable results to the lime industry as a whole.

Through the generous contributions of Mr. Emley and Mr. Porter and the intensive application of Mr. Miller, our fellow, we believe that we have opened up a line of endeavor which, as Mr. Rockwood has expressed it, makes much clearer to the "vision the time when lime manufacturers will not be making lime exclusively but *lime products.*[1] We look forward to being able to transfer this investigation to a lime plant within the next few months at which time we will be more at liberty to describe definite results.

Lime Research in Other Institutions

In addition to the fellowship work just described, we are also co-operating with fourteen other educational institutions and other organizations in investigations involving manufacture, properties or uses of lime. The subjects of these researches include a very wide range, among which might be mentioned: storage tests on lime products in various types of containers, study of the compounds of lime with sulphates, carbonates and aluminates, methods for the separation of the lime and magnesia of dolomitic lime, preparation of special inseciticides from lime and the use of lime as an admixture in insecticides for special purposes as well as a carrier of liquid insecticides, preservation of wood with lime compounds, the use of lime in trade wastes, methods for lime analysis, lime statistics, etc.

We have also supplied one of the larger technical societies with lists of problems of the lime industry and these have been distributed to all research members of the society. Our problems are thus brought to the attention of technical men and through these suggestions we have received requests for co-operation in investigations from a large number of outside laboratories. The outlines of practically all such investigations have been decided upon after a conference between our office and the directors of the laboratories involved. We wish to take this opportunity to express to those concerned our very great appreciation for the very valuable results from those investigations in which we have been able to participate.

We can not pass this discussion without also expressing our appreciation to those member companies through whose technical men and laboratory facilities we have been able to obtain information which has been very valuable to us in the prosecution of our promotion and research activities. We believe that these companies have in turn in practically every case received profitable returns from their efforts in this connection and that the more thorough and practicable such co-operation between individual members and the headquarters laboratory, the greater will be the productivity of our research programs. We also wish to thank the members who have so willingly co-operated in supplying samples in response to the various requests which we have made. We are glad to say that in no case has such a request been refused.

American Society for Testing Materials

Our activities in connection with the A. S. T. M. work have continued to consume considerable time but we believe that such time is profitably spent. It may be of interest to mention the fact that the 1924 A. S. T. M. standards include three standard specifications for lime for an equal number of uses and that the 1924 tentative standards include eight tentative specifications. Commitee C-7 is at the present time working on specifications for nine other uses and it is to be expected that several of these will appear in tentative form within the next year. These include specifications for lime for glass, sugar, gas purification, insecticides, bleaching powder, leather, greases, ammonia

[1] Rock Products, 27, 88, Dec. 27, 1924.

distillation, and metallurgical operations.

For those of you who are not so closely in touch with work which has been done on specifications it may be of interest to know that the Bureau of Standards has published specifications for lime for various uses for which there is no A. S. T. M. standard. These are as follows: Glass, Circular No. 118; Causticizing, 143; Sand-Lime Brick, 150; Ceramic Whiting, 152; Gas Purification, 189; Sugar, 207; Calcium Arsenate, 203. Those published by the Bureau of Standards for which Committee C-7 has already written specifications are Rag Cooking, 96; Sulphite Pulp, 144; Structural Quicklime, 201. Our office has been consulted by the Bureau of Standards and the Interdepartmental Conference during the preparation of all of these specifications and we have co-operated as best we could toward the development of a specification satisfactory to all concerned. We must admit that we have fallen short in complete accomplishment in a few cases but in general we can most heartily endorse the work of the Bureau and the Interdepartmental Committee.

Rule for Specifications

In the development of specifications for lime we have laid down as a guide certain rules which we have attempted to follow. Our position has been that the minimum requirements should be only so high as to permit of satisfactory results with the lime specified. This must be so for two reasons, viz: first, so that no manufacturer should be prevented from selling lime with which results satisfactory to the user are being and can be obtained and, second, because economically it is wrong to require the use of a raw material which is better than is necessary because the cost of production and the price of the finished product are thus unnecessarily increased.

Beyond these minimum limits the consumer should be allowed discretion and choice. It is for him to say whether he shall pay the higher price for the better raw materials and thus be compelled to charge the higher price for his product. Competitive conditions, local factors, efficiency of process, etc., all are factors in this decision.

We are glad to note very increased interest on the part of lime manufacturers in the A. S. T. M. work and we hope that the list of manufacturer members will be rapidly increased. This is one of the best means for the establishment of the position of lime as a chemical for obtaining the consequent beneficial results for the industry.

Technical Society Meetings

Four meetings of national technical societies have been attended during the past year. At these meetings papers directly involving properties and uses of lime in the manufacture of paper, the treatment of trade wastes, in animal rations, and a number of other uses were presented. One of these societies has a lime committee with which we cooperate and through which our interests are considered. The director of one of our fellowships is chairman of this committee.

It is very unfortunate that it has been necessary for us to miss several of the meetings of such organizations owing both to lack of funds and lack of time. But on the other hand we have been quite fortunate in having the co-operation of the central division office and through Mr. Arthur's kindness we have been supplied with reports on most of these meetings at which we were not directly represented but which in almost every case were attended by Mr. Arthur's field men. Valuable contacts were made by his men at the American Water Works Association meetings, the American Society for Municipal Improvements and various other meetings including local and regional sections of the American Water Works Association. We trust that facilities will be provided for the coming year so that we will find it possible to attend all of these meetings. We consider such activities among the most important.

Co-operation with Divisions

Although the divisional field work is not directly related to headquarters activities we feel constrained to mention this work in this connection. In the first place, to repeat the statements which we made last year, we believe that the field efforts in chemical lime promotion are among the most profitable of the association activities. It is through the efforts of these men that personal contact is made and the points of view, attitudes, and requirements of consumer are directly brought to our attention. We feel we cannot overestimate the value of the reports which come to us through the activities of the field men and we are much gratified to hear that future plans include increases in this chemical field staff in the central division. We are very much handicapped in our promotion work in the eastern section in not having chemical field representatives from whom we could receive first-hand information and through whom numerous profitable applications of developments in the headquarters office could be realized upon. We wish to express the hope that the manufacturers in the eastern section will see fit at the earliest opportunity to take advantage of what we consider to be an extremely valuable opening for such field work.

In this connection we must emphasize our belief in the necessity for co-ordination of field and headquarters activities and particularly those involving the chemical industries. The two activities must necessarily supplement each other and each is the more profitable the closer such co-ordination. We wish to commend the very excellent field work now being conducted by the central division and to express to the central division membership and to Mr. Arthur our appreciation of their most hearty co-operation. We know that the same co-operation would have existed between our office and the eastern division office had Mr. Camp had the facilities for the same kind of work.

Education Work

The activities in our educational program as described in last year's report has continued with increased results. We have had the opportunity to correct lecture notes and to prepare data and notes for lectures for chemistry courses in various educational institutions. This gives us an opportunity to see that facts are accurately presented and we believe also without prejudice. It is very difficult and frequently impossible for those in charge of educational courses to gain reliable and accurate information concerning industrial processes and we believe that an authoritative source of such facts is always welcome. Hence we believe we are contributing to the general information and well-being of the public as well as gaining certain selfish ends in the way of directing attention to lime and its possibilities.

Another of the results of this educational program has been the republication of a number of our bulletins, charts, etc., in various trade papers, government publications, etc. I would specifically mention the reproduction of our chart on uses in the recent publication of the Canadian Department of Mines describing the development of chemical, metallurgical and allied industries in Canada and also the inclusion in a recent book on lime of a large amount of data with which the author was supplied from our office.

Chemical Exposition

It is our plan to exhibit at the Tenth National Exposition of Chemical Industries which is to be held at Grand Central Palace, New York, the week of September 28, 1925. Such exhibits give us an opportunity definitely to present the idea of lime to the industrial public and each year to stress certain phases of our activities. We would appreciate very much having suggestions from the membership for this exhibit. We are glad to report that one of the members plans to make an individual exhibit at the same show and that other manufacturers are considering exhibiting.

Specialized Promotion

Yesterday we had the pleasure of listening to a very excellent discussion of the problem of trade wastes and the relation of lime to this development. This has been one of our specialized lines of activity during the past year and we feel that excellent progress has been made. We have had the co-operation of various state departments, sanitary district supervisors, educational institutions and manufacturers of equipment for this field. A paper describing the application of the lime-iron-sulphate method in the treatment of a particular waste was presented at the spring meeting of one of the large technical societies and a plant which is under construction for the opera-

tion of this process was described. This represents very definite progress in one of the largest sanitary districts in the east and we believe is an entering wedge for the adoption of lime in the treatment of textile and dye wastes. At the fall meeting of the same society last year, a plant which has been in operation for nine years treating creamery wastes with lime and iron-sulphate was described. The particular plant is typical of six which are now in operation in New York state.

We have been able through such co-operation and through the help of Mr. Arthur's men, to collect a very large amount of data and it is our hope to be able to get this into form in a very short time for a bulletin on the subject of trade wastes.

We have continued to give emphasis to the promotion of lime in water treatment and remarkable progress has been made as will be demonstrated by Mr. Hoover in his talk tomorrow. Lime softening of water is coming into its own. The fact that the central division has employed an experienced practical water treatment man for this specialized promotion has helped in an unmistakable manner in crystallizing the activities in this line. There have been a number of interesting developments in the technology of lime application, most of which will be mentioned tomorrow in connection with Mr. Hoover's paper.

The two problems, that of water treatment and that of industrial wastes, tie in very closely together and efforts expended in the promotion of one frequently results in directing attention toward the other. If we are to consider the health and happiness of the residents of the more important water sheds and river basins of the country, as expressed in a recent published article, "We must from now on take into consideration the limitations of the available water purification processes and we must provide a more proper disposition of the enormous quantities of sanitary and industrial wastes,"[2] which the rivers in these districts are now called upon to remove.

Competitive Materials and Processes

While we are investigating and promoting our own material we must not forget that the other fellows are also up and doing and that the rapid progress of chemical research is likely on a moment's notice to develop a material or a process which may even entirely eliminate our products from one or more of their largest uses. In other words, we must be prepared always to offset decided decreases in tonnage in many directions and the only way to be prepared for such exigencies is to have developed other uses for our product or to have extended its well-known uses by improvements in quality or improvements in the processes themselves.

We might illustrate by quoting from one of Arthur Brisbane's columns in a recent issue of one of the Hearst papers. He states that a reader in Texas says if the time wasted watching baseball matches were used in picking boll weevils, there wouldn't be any more cotton trouble. Unfortunately a majority of baseball "fans" live far from the boll weevil's residence. And they wouldn't pick the weevils anyhow. Of course, we believe that our tonnage of lime for calcium arsenate will be not be seriously menaced by the efforts of baseball fans in picking weevils, but we must recognize the fact that the Department of Agriculture and particularly the Bureau of Chemistry, in co-operation with the field laboratories and Chemical Warfare Service, are working hard on new methods for weevil control, and there is always the possibility that some other and better insecticide at any time may be developed.

What can happen is very well illustrated by the recent development abroad of a process for synthetic wood alcohol (methanol) by which this product, it is rumored, can be made at a cost of 18 cents per gallon and at this figure can unquestionably replace that produced here by wood distillation processes. Such a substitution may very materially affect the sales of lime for the manufacture of acetate of lime which is one of the products of the wood distillation industry.

Another example is a new process for the cooking of straw for the production of a special strawboard which is being tried out by one of the government laboratories. This process replaces the lime cooking process. If should prove profitable, our only salvation, of course, is to improve the lime process so that it will meet the requirements, but if it is impossible to do this we must accept the situation and develop some new use or extend some of the known uses to offset the loss. Any number of such competing processes might be mentioned.

It is well also to note in this connection that the stabilization of conditions in Europe is bound to have its effect on the chemical industries of this country and is most certain to result in much keener competition. Just what the results of this will be it is too early to predict but those supplying the chemical trade should have their ears to the ground and should be protected as previously suggested. It must be remembered that chemical prices are at the present showing a tendency to decline. This is the result of business conditions in those industries which are the larger consumers of chemical lime. Of nine of these great industries, only one, viz: the textile, shows an index of employment for January, 1925, higher than for January, 1924. We do not mention this because we have a pessimistic outlook for the future but simply as a warning, and to illustrate one of the numerous conditions with which we are confronted in the promotion of our material.

One of the best possibilities for increasing lime consumption, we contend, is by knowing and improving our product and being able to give valuable service to the consumers. A condition such as described in a recent issue of Rock Products in the following words of a consumer is one which is not salutary to the industry and one which we strive to avoid. This consumer says: "We purchase 800 tons of lime per month, using it to make calcium carbide. In the last four years we have been unable to obtain accurate analyses from producers within a 200-mile radius. The National Lime Association has no information in regard to these particular limes. Chemists capable of making accurate analyses and combustion engineers who can properly operate kilns and keep lime manufacturers from spoiling good limestone in lime making by using sulphurous and cheap coal ought to be a real necessity at any plant specializing in chemical lime. The most important problem is to make the lime industry attractive to such men. When producers come to know their products thoroughly they will each find the proper outlet for their limes."[3]

We do not believe that this accusation is entirely justified in all particulars nor do we believe that every lime manufacturer supplying chemical lime is justified in maintaining a chemical laboratory. But we do believe that our headquarters laboratory can perform a valuable function as an intermediary between such producers and such consumers. If we who manufacture and study it do not know all the facts about our product, what can we expect of the other fellow?

Sales Promotion

It is in this connection that the sales promotion meetings which have been held in the two divisions will bring most profitable results. The opportunity to discuss problems connected with uses and to learn more about the material being sold must necessarily result in a higher type of salesmanship and the development of more profitable contacts between salesmen and consumers. We only hope that the program for these sales promotion meetings can be extended quite materially.

There are unquestionably innumerable numbers of possibilities for lime in fields barely scratched, but progress must necessarily be slow in any particular line and we must not be impatient if we can not each month or even each year count up enormously increased tonnages in any particular line. It must be remembered also that the effect of association work in such a technical field is cumulative. Like the proverbial snowball, it gains weight as it moves forward and as we increase our efforts in overcoming the increased inertia, the increased momentum must necessarily have its effect. We are today realizing upon the results of the first handful of snow to this promotion snowball, contributed by the pioneers of the association, and fortunately for the industry and for those directly connected with the work

[2]Jour. A. W. W. A., 13, 298 (1925).

[3]Rock Products, 27, 88, Dec. 27, 1925.

no particular individual is able to identify his own contribution or to claim special results. In such co-operative work the contribution of each and every man connected with the industry is essential to its success and is responsible to no small extent for the final accomplishments.

Lime Tonnages and Advertising

This leads us to the concrete and important question of production and consumption in our industry. We believe that the trend of interest in any field is rather clearly indicated by the advertising in that field and it may be of interest to mention that interest in the chemical lime business and sales is reflected in the fact that the April, 1925, issue of one of the chemical journals carried the ads of four manufacturers of lime—two of these being full page ads—whereas the corresponding issue in 1924 carried the ad of only one company. This represents, in other words, an increase of approximately 500% in advertising space devoted to chemical lime. It is of interest to note also that three of these advertisers are members of the National Lime Association, the fourth, a non-member, having entered the field of advertising only recently. One of these advertisers has been a constant user of space in the technical press and we believe that this fact, coupled with the very excellent qualities of this company's products, explain its ability to find markets on both coasts.

As explained above, there has been a slight loss in the tonnage of lime in the chemical industries during the past year, owing to the condition of some of the largest consuming industries. But fortunately this loss has been compensated for by activity in building and construction and preliminary reports indicate that the tonnage for 1924 was approximately the same as that for 1923, with practically no change in total value. To be exact, the preliminary report of the United States Geological Survey indicates a 1924 tonnage of 4,022,000 tons as against 4,076,000 tons for 1923. About 53% of the total output was used in building, 41% in chemical industries and 6% in agriculture. These statistics, as you know, are only approximate, but are quite reliable as an index of tonnages. As you probably all know, the United States Geological Survey has included a number of additional requests in their questionnaire submitted for returns on the 1924 sales and when this data has all been compiled we will be in a much better position to analyze the situation. We trust that every manufacturer will give his hearty co-operation to the United States Geological Survey in their efforts to give us this information.

While on this subject of lime tonnages, we are confronted with the very significant fact that, although the total tonnage for lime has not materially increased during the past year, nevertheless the production of hydraulic limes and the natural cements has shown extremely remarkable growth. Their production more than doubled between 1919 and 1923, reaching a figure in the latter year of 1,271,674 bbl.,[4] and in the same period their value has more than trebled. When we consider the very large number of these products which are entering the field and the fact that we are soon to be in competition with such products to be used as stuccos and interior plasters, we believe that these tonnage statistics hold considerable significance.

In this connection exportation and importation statistics are quite significant. These figures we believe show enormous possibilities for the development of an export trade for lime in adjacent countries. A remarkably large number of personal inquiries and requests by correspondence have been made to our office by prospective lime manufacturers in adjacent territories for information regarding manufacture and uses. It occurs to us that these requests indicate increased interest in lime in these countries and suggests the possibility of extended markets for our own manufacturers.

Assistant General Manager and Agricultural Director R. C. Towles

In conclusion we would respectfully present the following recommendations relating to the chemical activities for the future:

1. Continuation of all activities of the past year.
2. Increased facilities, either direct or indirect, for chemical field work.
3. Enlargement of the scope of the fellowship work including both additions to the numbers of fellowships and increased endowments in certain cases.
4. Provision for an extensive investigation of the field for lime products not now manufactured by our members.
5. Increased facilities for co-operation with manufacturers in their efforts to improve processes and products.

[4]Rock Products, 27, 89, Dec. 27, 1925.

Agricultural Activities

By R. C. Towles
Soil Technologist

IN reviewing the agricultural activities of your association during the first 10 months of the present fiscal year, the outstanding feature presents itself in the fact that of the total amount of money spent for agriculture, over 70% has gone into research work. All of this research is being carried on in co-operation with state institutions over the country, some of it as fellowship work and some directly by the regular state college and experiment station employes.

Tennessee Fellowship

The close of this fiscal year will mark the end of the fourth year of the Tennessee fellowship, in which studies have been made of high calcic and high magnesic limes in amounts chemically equivalent to ground limestones of four separates. These various separates of raw stone have also been compared with each other. Depth of incorporation of all the liming materials has also been included in the project, and comparisons have been made between the effectiveness of amounts of lime varying from 250 to 2000 lb. per acre in both the upper and lower zones of the soil. Your soil technologist visited with the Tennessee people and went over this project last fall.

During this month the tanks which have been used in these studies are being disrupted and samples removed to the laboratory, where the fifth and last year of the project will be devoted to laboratory checking and analyzing. As a result of these studies Dr. McIntire, under whose guidance this complicated work has progressed so smoothly, advises that it is now being grouped for final conclusions, and he has submitted to us an outline for the publication of eight papers which he will prepare from the data obtained. Some of these results are very interesting, but Dr. McIntire has asked us to refrain from drawing hasty conclusions which laboratory findings later on may or may not substantiate, and we therefore make no definite statements at this time as to the benefit our industry may expect therefrom.

Virginia Research

Last year Director Ellett of the Virginia Experiment Station became sufficiently interested in one phase of our Tennessee project so that he desired to duplicate it. Through Dr. McIntire we arranged with the Virginia people to supply them with 31 additional lysimiters, which we have done. The purpose of this Virginia project is to compare the immediate applications of the amounts of lime ordinarily recommended with the accumulative systems for making such additions, for the purpose of determining whether or not there is a sufficient amount of leaching and tenacious fixation of lime in the soil to permit a small applica-

tion to desirably affect one crop in the rotation and at the same time to insure its absence for subsequent non-lime loving crops. Such a condition would permit of liming more freely on truck crop lands.

Wisconsin Fellowship

The fellowship which was installed at the University of Wisconsin during our fiscal year of 1923-2 was provided for again this year. The object of this work primarily is to measure the worth of small applications of the burned forms of lime at frequent intervals as against the worth of the system of applying large amounts of the slow-acting raw forms at less frequent intervals. Since the last convention a representative of the association has visited with the Wisconsin people in order to inspect the project. The progress of these studies is very well set forth in the following excerpt from a report by Dean A. R. Whitson, who is in charge of the fellowship:

"We now have under way work on essentially all lines under the project which were included in the original suggestions made by the association. We are starting this spring a field on acid peat soil, thus giving us three good fields on that number of radically distinct soil types, all of which are distinctly benefited by lime. The emphasis is of course being placed on the practical field aspects in comparisons of the different forms of lime and especially in comparisons of small amounts of different forms and on those crops which in general show a maximum benefit from lime applications. Together with these studies, we are carrying on studies, on the effects of lime such as 'Influence on Nitrification and Nitrogen Fixation' and on the 'Relation of Acidity to Lime Requirements.' Since the field work was only started a year ago not much direct result was obtained from the field work that year, but we have every reason to expect more definite results during this second season since we shall have all of the crops involved growing on treated land.

"Plant house work parallel to that in the field has been carried on and we are getting rather definite indications that, when applied in chemically equivalent amounts, lime hydrate is more effective in promoting growth than limestone. We are also getting rather definite evidence that quicklime is more effective in increasing the rate of nitrification than is limestone in equivalent amounts, and that amounts of quicklime equivalent to 1000 lb. of limestone are quite effective in that respect, though the increase is not so great as when heavier applications are made."

West Virginia Tests

Three years ago a project was outlined in co-operation with the University of West Virginia whereby they agreed to make a very comprehensive study of maintaining and improving permanent pasture land. Our part is to furnish the lime. These experiments consist of a large series of plats that are treated with various fertilizing materials, half of each plat being limed and half unlimed, and so fenced in that part of each plat is grazed by cattle and part mowed and the growth of pasturage weighed. Flora counts on each of the plats are also included in the work.

A representative of the association visited with these West Virginia people last fall, and they have now furnished us with a report of the first two years results. They desire us not to publish anything until after the end of this season, at which time they intend also to publish results, but without making known any actual figures we are glad to report that 1500 lb. per acre of hydrate as a top dressing once in three years has proven to be more efficient than annual applications of either 300 lb. of acid phosphate, 100 lb. nitrate of soda, 8 tons of barnyard manure or combined applications of acid phosphate and manure.

Nebraska Fellowship

The purpose of the fellowship at Nebraska is to determine the nature, extent and desirability of the effect of various liming materials on the physical properties of the soil.

This project was started the latter part of 1923 and is under the supervision of Profs. W. W. Burr and J. C. Russel. The university has not only augmented the efforts of our fellow on this project by allowing Professor Russel to work right along with him but has gone to a great deal of expense in making available costly machinery and equipment for studying soil cohesion, adhesion, elasticity and other fundamental physical properties.

Since the last convention one of our representatives has visited with the Nebraska people, and up to the present time two phases of the subject have been studied: first, the effect of liming materials on the reception and conservation of moisture; second, the effect of liming materials on the fundamental physical properties. In the former study a number of small plats were laid out in a field of uniform slope, and applications of various liming materials were made to the individual plats. At regular intervals moisture determinations were made on each plat and the indications are that hydrated lime at high rates of application per acre lead a considerable accumulation of available moisture in the second and third feet of the soil. Light applications thus far seem to have produced little if any measurable effect.

In the latter study soils from different states were treated with different liming materials and kept in storage at optimum water content for two months. They were then subjected to a number of tests to determine the effect of the various treatments. Although the various materials used have had a flocculating or granulating effect, it has been found difficult to measure exactly the changes in cohesion, adhesion, etc., and in order to get at these properties more accurately a deviation has been made from the original outline and a special work is being done on a pure clay extracted from a soil of high clay content. Other studies now under way on this project are: (1) laboratory determinations on the effect of liming materials on the permanency of the granular structure, (2) observation of structural differences resulting from lime applications upon soils from various parts of the country and (3) various field plat studies on limed and unlimed soils located at Crete, Rockford and Lincoln, Neb. The effect of lime on physical properties of all field plats is also being measured in terms of resistance to plow draft.

Publications and Display Material

The Agricultural Lime News Bulletin has been published at two months intervals since the last convention, six numbers in all having come from the press. One copy of each issue has been distributed free of charge to our list of about 8000 teachers and county agents over the country and in addition to this distribution we have during the past year secured standing orders from 16 member companies for 100 to 500 copies of each edition. In the writing of this news bulletin an effort is made to go over all experiment station and governmental agricultural literature and also the agricultural trade press and such articles as seem conducive to the welfare of our industry are reviewed.

One entirely new bulletin on the relation of clover failures to lack of lime has been prepared and is now off the press and ready for distribution. It consists chiefly of testimonials from various areas in the clover growing belt and shows conclusively that where lime is lacking in the soil it is practically a waste of good seed to try to get clover unless the lime requirement is at least partly satisfied.

Two hundred and fifty more sets of our "Five Agricultural Charts and Five-Minute Lime Talks" have been put out during the past year, and although they have been sent out only upon written requests from teachers and county agents, the supply is now practically exhausted.

One hundred new agricultural lime cabinet sets were built during the year. As in the case with the charts, these are also sent out only upon special request on an application blank which we furnish to those interested; the entire 100, however, were used up and we now have about 50 unfilled requests and are building 100 cabinet sets to take care of them.

Miscellaneous

Last fall our Consultant Professor Slipher was elected to lead the liming conference held before the American Society of Agronomy's annual meeting at Washington. His paper was published in the *Journal* of the proceedings of that society and has thereby reached every soil investigator of prominence in the country. The soil technologist accepted an invitation to go on the program

of the agricultural group meeting of the National Crushed Stone Association's convention at Cincinnati in January, and both of our consultants and the soil technologist as well have accepted invitations to take part in many meeitngs and discussions of lesser importance.

Some of our exhibit material was loaned for use on two special soil liming trains during the past year, one in the eastern division and the other in the central division, and we donated literature for distribution on both of these trains. We have handled, as well as our facilities would permit of, the matters of an agricultural nature which have been referred to the national office by various members, and such inquiries have in some instances served to open up new avenues for the possible distribution of our product, but limitation of our force has not permitted personal contact to be made in as many of these cases as it would have been desirable. Our files show that during the year an unusually large amount of correspondence has been carried on both by our office and by our consultants, who have furnished copies of such correspondence for our files, in connection with answering inquiries from various parts of the United States and other countries as well on specific phases of the use of lime in crop production and crop protection.

Unofficial reports which have come to us within the past month indicate that all over the country there has been a larger consumption of soil liming materials this year than during any spring season for several years past. This would indicate that the seeding of small grain during the coming fall will offer an excellent opportunity to push the use of soil limes, because just prior to fall seeded grain is generally recognized as the ideal time for liming land.

Construction Report

By R. P. Brown
Construction Engineer

DURING the past year our activities have centered in the preparation of bulletins and articles, and the results as judged by the space in trade and technical magazines have been quite satisfactory. This year has seen more articles in the press on lime in construction than ever before. Bulletin 310, "A visit to Muscle Shoals," was reprinted in four of the papers; Bulletin 311, "Hydrated Lime Makes Concrete More Workable," appeared in three, and "The Binder in Your Wall" has been reprinted once. Bulletin 305-A, "Standard Specifications for Lime Plaster," has appeared several times, and 300-A, "Lime and Lime-Cement Mortar," has been reprinted a couple of times. Five special articles have been prepared in response to requests and several short articles on lime in construction have been released.

We review about 30 papers, and every one of them has made comment on each of the bulletins issued by this office. These comments have ranged from a brief announcement up to a full page description of the bulletin and review of the data presented. The type of material being issued is meeting with favorable comment in the press, and also from the engineers, architects and contractors who receive it. It is also entirely possible that material originating in this office has appeared in other publications which we do not receive regularly.

Arrangements have recently been made for two new series of articles, one series in a middle western paper and the other in a national publication. The manuscript for the first two articles has already gone forward.

Construction Director R. P. Brown

Seven special field trips have been made, five to investigate complaints and two by special request. The results of these trips have been good, for where lime was blamed for trouble, we were able to show that it was not to blame, and in every instance we were able to stimulate the use of more lime. The importance of having some one on the job at the first indication of trouble cannot be too highly stressed, for then the difficulty can be immediately and easily corrected, while an investigation several months afterwards frequently finds essential evidence missing and a bad impression rather firmly established.

Fellowship Work

The fellowship work this year has been very encouraging. Dean E. J. McCaustland from the University of Missouri has already discussed in considerable detail the work done under his supervision on lime in dirt roads at the University of Missouri and so a review of that work is unnecessary. The information secured there will undoubtedly prove to be the basis for a substantial increase in lime tonnage, particularly in the rural districts. The work on the sand carrying capacity of lime is also progressing nicely. The endeavor has been to determine when a mortar is over sanded and when it is under sanded. Apparently the use of less than 10% of lime by weight in the mortar is unsafe, for the mortar is then structurally weak and crumbly, and this likewise is checked by a plasticity determination. In that test the force registered on the machine should be not less than 10, for a lower force indicates an extremely harsh working mortar, not satisfactory to handle. However, too much lime in a mortar means increased shrinkage, which likewise means trouble, and it is thought that 15% shrinkage by volume is about the safe limit. A mortar composed of 15 parts by weight of hydrate and 85 parts of sand gives very good results in the laboratory, regardless of the type of hydrate used. This mortar corresponds roughly to a field mix of 1:3¼, using moist sand. When quicklime is used, slightly less lime is required. Although the final results have not yet been determined, the indications are that much the same relation holds in the field proportions as exists in the plant between quicklime and hydrate production. This of course is not the chemical relation of 56 to 74, which makes no allowance for loss or commercial discrepancies, but the fact remains that there is a difference.

The results of the work on acoustics are also encouraging. The fellowship work has been completed, and the final report on this work is promised early in June. From the preliminary data which we have seen, this piece of research should prove of great interest and value to the lime industry.

Work With Other Associations

This year the report of the lime committee of the Building Officials Conference is still more complete than the one issued last year. It presents in compact form a full set of stucco and plaster specifications, in addition to the regulations as to mortar and hydrated lime in concrete. This organization holds a high position in municipal circles and the reports of the various committees bear considerable weight in the preparation of new codes and in the revision of existing ones. The lime committee has been continued, for we hope that before long a report on the lime block may be presented to still further increase the interest in lime.

Considerable work has been required in connection with the work of Committee C-7 on Lime of the American Society for Testing Materials. In addition to acting as sec-

retary of the committee, the writer is also active on behalf of the industry in the work involving specifications for lime for structural purposes. This work involves a good deal of routine and special correspondence, as well as the periodic work required in the preparation and distribution of reports, minutes of meetings and ballots.

The handling of the regular office correspondence, which is slowly but steadily increasing, from manufacturers as well as users of lime, also takes time. Of course many of the requests that come in can be taken care of by bulletins, but a considerable portion require special attention.

Special attention has been called to the correlation of laboratory experiments and field practice. Although the proportions used in the laboratory and in the field are apparently widely different, when due allowance is made for the "bulking" or "swell" of sand in the field due to moisture, the actual ratio between the lime and sand is practically constant. In other words, a laboratory mix of one part of hydrated lime to 4½ parts of oven dried sand by weight is equivalent to a field mix of one part of lime to a full 2½ parts of sand (moist) by volume.

Causes of Efflorescence

Considerable work on the cause and prevention of efflorescence on brick and stone masonry is under way at the Bureau of Standards. This work, although it is under the direction of the brick and stone industries, is of interest to the lime industry as well. The work is not contemplated, but such information as we have been able to secure indicates that a good lime mortar is safe and is *not* the cause of the white fuzz so frequently seen. We are also watching the results of bond tests in which various kinds of mortars are being compared. These results should be released in a comparatively short time.

Each year brings new developments in the construction uses of lime and increases the possibilities for its use in either entirely new channels or through increased knowledge of its value in the ordinarily known uses. This of course increases the activities of this office and affords additional opportunities for service to the industry.

National Lime Convention Round-Table Discussion of Lime Plant Operation

The second annual research council, under the chairmanship of Dr. Fink, was better attended than the first one held a year ago; and even more interest was manifest. An imposing array of questions was submitted for discussion, but unfortunately the time was too short to get beyond the first one or two questions, which concerned the dimensions of lime kilns and kiln operating factors.

A leading part of the discussion was taken by Victor J. Azbe, consulting engineer, St. Louis, Mo., who endeavored to show a parallel between boiler operation and efficiency and lime-kiln operation and efficiency. The trouble with lime-kiln operation, he said, was the entire lack of any standard of comparison. In order to have a starting place for such a basis of comparison he pleaded (without success) for a committee of the association which would adopt a standard, similar to square feet of heating surface, the standard of comparison in boiler design.

Mr. Azbe suggested for such a standard the cubical content of the kiln, since it is impossible to determine the heating surface of a lime kiln. (The heating surface of a lime kiln is the surface of all the rock exposed to useful heat.) The cubical content of the kiln, however, is in direct proportion to the surface of rock exposed, and could be used. Experiments that he has made on various kilns showed that for one ton of lime produced per day the cubical capacities of lime kilns varied all the way between 107 and 225 cu. ft. of burning and preheating space. Probably an efficient operation means one ton of lime produced per day for each 100 cu. ft. of burning and preheating kiln space. Therefore a kiln with storage space equal to calcining and preheating space could be designed with a capacity of 15 tons of lime per 24 hours and a cubical capacity of 3000 cu. ft.

Mr. Azbe said kilns could be designed too large for proper control of the heating operation. He emphasized the necessity of considering the time element in calcination, and has determined both theoretically and experimentally that the best efficiency is obtainable when the exhaust gases from the kiln are about 720 deg. F. In practice a daily average of between 500 and 600 deg. is the best obtainable. This was checked and o.k.'d by Irving Warner, chief engineer of the Charles Warner Co. and the American Lime and Stone Co. at the meeting.

In other words, much more heat is available for preheating the stone than can be utilized by the amount of stone that can go through the kiln and be converted into lime in the necessary time period.

William E. Carson, president of the Riverton Lime Co., Riverton, Va., insisted that the density and the size of the stone had much to do with kiln capacities. He said his experience showed that when the kiln exhaust gases were around 225 deg. F. the kilns were properly balanced.

H. Dittlinger, president of the Dittlinger Lime Co., New Braunsfels, Tex., said variability in the fuel used was an important factor; and that square feet of grate area was a means of comparing kilns.

Dr. W. L. Ellerbeck, vice-president and general manager of the Utah Lime and Stone Co., Salt Lake City, Utah, insisted that the *kind* of limestone had much to do with kiln capacity, or efficiency.

Thomas J. Curtin, vice-president and general manager of the Farnam-Cheshire Lime Co., Pittsfield, Mass., said that when limestone was saturated with water his production fell off nearly a third; that the dryest stone was the easiest to calcine. (Mr. Carson had previously stated that the *damper* the stone the easier it was to calcine.) Mr. Curtin said that his new kilns, with closed tops and with stacks, insulated with Sil-O-Cel, were 40% more efficient than his old open-top kilns of the same dimensions. He said in his case the cubical content of his kilns was determined by the amount of overburden in the kiln his lime could stand without crushing. He said the determination of the size of the burning zone was a matter of experience with different stones.

Warren E. Emley, U. S. Bureau of Standards, speaking of the effect of the moisture in stone on the efficiency of the calcining operation, called attention to Herzfeld's experiments of calcining limestone in superheated steam at about 200 deg. less temperature than is required with dry heat.

Mr. Azbe, in replying to these various expressions of opinion and experience endeavored to show that it could be taken for granted that these *were* all variable factors and could be treated as such, but that the crying need of the moment was some sort of a *basis of comparison of kiln efficiencies*, and that it was his idea that cubical content offered the most feasible solution.

Freight Rates a National Issue

The attention of the convention was called to the act of Congress, January 30, 1925, directing the Interstate Commerce Commission "to make a thorough investigation of the rate structure" and "to make such changes and adjustments" as may be deemed necessary or desirable. Lowell M. Palmer, president of the Palmer Lime and Cement Co., New York City, stated the case, and urged the appointment of a national traffic committee to uphold the cause of lime in any revision of the basic rate structure.

Mr. Palmer said that various organized industries had already filed briefs setting forth the transportation characteristics of their commodities, and petitioning for hearings in case changes in freight rates on these commodities were under consideration. A brief representing the statement of the Eastern District Lime Traffic Association, of which J. L. Durnell (Knickerbocker Lime Co., Philadelphia, Penn.) is president, was filed with the Interstate Commerce Commission, May 15. This brief gives some interesting and instructive comparisons and contrasts in freight revenue from carloads of various kinds of commodities.

President Wood said that the matter of freight rates had always been considered a

local issue and one in which the National Lime Association could not interest itself without becoming involved in controversies between its own members, but this was a national issue. However, he did not favor taking it up as a National Lime Association activity. The general opinion was that it was a matter of moment to the lime industry as a whole, and the necessity of co-operative effort was recognized. The matter was put to vote and resulted in the appointment of a traffic committee which will represent the various traffic districts, and which will devise a traffic association to handle the matter.

Sports and Entertainment

As was the custom inaugurated at last year's convention, there were golf, tennis, quoits and bridge-whist tournaments, and a baseball game to boot. Prizes for these events were contributed by the Valve Bag Co. of America, which also entertained the convention at a banquet on Thursday evening. Philip Corson, of G. and W. H. Corson, Plymouth Meeting, Penn., won the golf tournament and broke the amateur record of the Briarcliff course at the same time by doing the 18 holes in 71, one better than the record. George Urschel, son of J. J. Urschel, Woodville Lime Products Co., Woodville, Ohio, was next best, and Wm. C. Bird, general superintendent of the Rockland and Rockport Lime Corp., Rockland, Me., came third in golf proficiency.

Burton A. Ford, general manager of the National Lime Association, repeated his achievement of last year by winning the tennis tournament, and P. L. Bock, of the Security Cement and Lime Co., won the quoits tournament.

(Other features of the convention will be reported in succeeding issues)

REGISTRATION

Abbey, Wm. B., the Abbey Co., Newark, Penn.
Arthur, G. B., N. L. A., Chicago, Ill.
Adams, F. W., Mass. Inst. Tech., Cambridge, Mass.
Azbe, V. J., St. Louis, Mo.
Alderton, E. F., Security Cement & Lime Co., Hagerstown, Md.
Aldous, Jos. C., Mississippi Lime & Material Co., Alton, Ill.
Aitkin, Howard, Miller Tompkins Co., New York City.
Bogart, R. L., Palmer Lime & Cement Co., New York City.
Battey, W. A., Pennsylvania Crusher Co., Philadelphia, Penn.
Bock, P. L., Security Cement & Lime Co., Hagerstown, Md.
Bird, W. C., Rockland and Rockport Lime Corp., Rockland, Me.
Bird, Mrs. Wm. C., Rockland, Me.
Burt, L. B., N. L. A., Chicago.
Blyth, J. F., Newark, N. J.
Black, A. S., Boston, Mass.
Bowles, O., Bureau of Mines, New Brunswick, N. J.
Brown, R. F., N. L. A., Washington, D. C.
Bliss, Lucy, N. L. A., Washington, D. C.
Brown, R. C., Western Lime & Cement Co., Oshkosh, Wis.
Besselievre, E. B., Dorr Co., New York City.
Bye, C. C., Charles Warner Co., Wilmington, Del.
Cutler, George, Rockland and Rockport Lime Corp., New York City.
Camp, Henry M., N. L. A., Washington, D. C.
Carson, W. E., Riverton Lime Co., Riverton, Va.
Cole, S. E., Pit and Quarry, New York City.
Corson, Philip L., G. & W. H. Corson, Plymouth, Meeting, Penn.
Cobb, C. W. S., Glencoe Lime & Cement Co., St. Louis, Mo.
Chiles, J. H., Austin White Lime Co., Austin, Texas.
Cover, L. A., Jr., Security Cement & Lime Co., Hagerstown, Md.
Cover, Mrs. L. A., Jr., Hagerstown, Md.
Cabell, C. A., N. L. A., Washington, D. C.
Curtin, C. J., Jr., Farnam Cheshire Lime Co., New York City.
Curtin, Thos. J., Farnam Cheshire Lime Co., Farnams, Mass.
Cadman, C. M., Pacific Lime & Plaster Co., San Francisco, Calif.
Carter, E. C., Best Bros. Keen Cement Co., Chicago, Ill.
Daboll, Fred A., Charles Warner Co., Philadelphia, Penn.
Damon, D. F., Cement Mill & Quarry, New York City.
Durcan, E. F., P. J. Durcan, Inc., New York City.
Day, O. L., Harbison-Walker Refractories Co., Cleveland, Ohio.
Doyle, W. P., Sturtevant Mill Co., Boston, Mass.
Deely, J. M., Connecticut Lime Co., Lee, Mass.
Dittlinger, H., Dittlinger Lime Co., New Braunfals, Texas.
Eakins, E. E., Chas. Warner Co., Devault, Penn.
Ellerbeck, W. E., Utah Lime & Stone Co., Salt Lake City, Utah.
Emley, W. E., Bureau of Standards, Washington, D. C.
Felton, A. V. A., New England Lime Co., Danbury, Conn.
Faist, J. L., Woodville Lime Products Co., Toledo, Ohio.
Flaherty, W., Hoosac Valley Lime Co., Adams, Mass.
Flaherty, Mrs. W., Adams, Mass.
Faist, G. H., Woodville Lime Prod. Co., Toledo, Ohio.
Finn., L. J., Bemis Bro. Bag Co., St. Louis, Mo.
Ford, Burton A., N. L. A., Washington, D. C.
Ford, Mrs. B. A., Washington, D. C.
Fink, G. J., N. L. A., Washington, D. C.
Fink, Mrs. G. J., Washington, D. C.
Fraunfelder, G. D., Easton Car & Construction Co., Easton, Penn.
Frayer, James, Wisconsin Lime & Cement Co., Chicago, Ill.
Fetter, R. S., B. H. Stoll Co., Buffalo, N. Y.
Gawthorp, H. A., Merion L. & S. Co., Norristown, Penn.
Gilbert, F. B., Security Cement & Lime Co., Hagerstown, Md.
Gager, J. M., Gager Lime & Manufacturing Co., Chattanooga, Tenn.
Gager, Mrs. J. M., Chattanooga, Tenn.
Graham, N. B., Reiter Co., Elgin, Ill.
Greeves, R. G., Kelley Island Lime & Transport Co., Toledo, Ohio.
Grant, Jos. C., Jointless Fire Brick Co., Chicago, Ill.
Gibson, D. D., Building Supply News, Chicago.
Hirsch, W. C., Building Supply News, Chicago.
Hall, J. G., H. Miscampbell, N. Y.
Hay, W. C., Blue Diamond Co., Los Angeles, Calif.
Hartman, C. H., Valve Bag Co., Toledo, Ohio.
Hartman, Mrs. C. H., Toledo, Ohio.
Haslam, H. T., Massachusetts Institute of Technology, Cambridge, Mass.
Hartshorn, S. D., Pennsylvania Crusher Co., Philadelphia, Penn.
Hulsart, C. R., Atlas Lumnite Cement Co., New York City.
Hewitt, L. C., Laclede Christy Clay Products Co., St. Louis, Mo.
Hughes, G. W., Manistique Lime & Stone Co., Manistique, Mich.
Hurley, J. J., National Lime Association, Chicago, Ill.
Kuntz, W. J., McGann Mfg. Co., York, Pa.
Kowalke, W. R., Sheboygan Lime Co., Sheboygan, Wis.
Kowalke, Mrs. W. R., Sheboygan, Wis.
Kanowitz, S. B., Raymond Bros., Chicago, Ill.
Kennedy, F. W., Cement, Mill & Quarry, Chicago, Ill.
King, Gleason G., Palmer Lime & Cement Co., York, Penn.
Kritzer, Chas. C., Kritzer Co., Chicago, Ill.
LeGore, Geo., LeGore Lime Co., LeGore, Md.
Lundteigen, A., Ash Grove Lime & Portland Cement Co., Kansas City, Mo.
McNulty, Bernard L., Marblehead Lime Co., Chicago, Ill.
McElroy, R. H., International Clay Mach. Co., New York City.
McCall, A. G., National Lime Association, College Park, Mo.
McCall, Mrs. A. G., College Park, Mo.
McCaustland, E. J., National Lime Association, University of Missouri, Columbia, Mo.
McIntire, W. H., University of Tenn., Knoxville, Tenn.
McLanahan, J. King, Jr., Marblehead Lime Co., Hollidaysburg, Penn.
Martin, Mrs. C. C., Luckey Lime & Supply Co., Luckey, Ohio.
Martin, C. C., Luckey Lime & Supply Co., Luckey, Ohio.
Mack, A. B., Kelley Island Lime & Tr. Co., Cleveland, Ohio.
Munday, Harold W., Pit and Quarry, Chicago, Ill.
Moons, Mrs. H. N., Springfield, Ohio.
Moores, Wm. H., Moores Lime Co., Springfield, Ohio.
Moores, Mrs. Wm. H., Springfield, Ohio.
Murphy, J. F., Prest-O-Lite Co., Inc., New York City.
Miller, E. A., N. L. A., Bureau of Standards, Washington, D. C.
Milner, E. H., Mississippi Lime & Material Co., Alton, Ill.
Mathers, F. C., Indiana University, Bloomington, Ind.
Mansfield, R. L., Tobey Lime Co., West Stockbridge, Mass.
Montgomery, C. L., Vermarco Lime Co., West Rutland, Vt.
Nieman, H. W., Luckey Lime & Supply Co., Luckey, Ohio.
Nieman, Mrs. H. W., Luckey, Ohio.
Norrington, W. H., Robins Conveying Belt Co., New York City.
Nothacker, W. F., Sanderson-Cyclone Drill Co., Orrville, Ohio.
Oppenheimer, O. W., Pittsburgh Steel Drum Co., Pittsburgh, Penn.
Olney, W., Elk Fire Brick Co., Boston, Mass.
Pollock, W., Marblehead Lime Co., Chicago, Ill.
Pollock, Mrs. W., Chicago, Ill.
Peotter, R. S., Marblehead Lime Co., Chicago, Ill.
Pellett, Frank F., Abbey Co.
Palmer, Lowell M., Jr., New York City.
Palmer, Mrs. L. M., New York City.
Pinnegar, F. M., Detroit, Mich.
Pollock, J. F., Ash Grove Lime & Portland Cement Co., Kansas City, Mo.
Pratt, H. D., New York City.
Phillips, W. R., New England Cement & Lime Co., Rockland, Me.
Porter, J. M., Bureau of Standards, Washington, D. C.
Page, Edw. B., Rockland & Rockport Lime Corp., New York City.
Read, Thos. L., Kelley Island Lime & Transport Co., Cleveland, Ohio.
Rea, A. N. Jr., Union Lime Co., Los Angeles, Calif.
Rockwood, Nathan C., Rock Products, Chicago, Ill.
Robins, Thomas, Jr., Robins Conveying Belt Co., New York City.
Roth, Miss E. H., Sheboygan Lime Works, Sheboygan, Wis.
Siegrist, H. L., Bridgeport, Conn.
Siegrist, Mrs. H. L., Bridgeport, Conn.
Smith, H. W., Chas. Warner Co., Wilmington, Del.
Sturtevant, L. H., Sturtevant Mill Co., Boston, Mass.
Schaffer, F. W., Schaffer Engineering Co., Pittsburgh, Penn.
Stolzenbach, Wm. F., National Mortar & Supply Co., Pittsburgh, Penn.
Shallcross, S. M., American Lime & Stone Co., Bellefonte, Penn.
Slipher, John A., Ohio State University, Columbus, Ohio.
Slipher, Mrs. J. A., Columbus, Ohio.
Sunderland, Paul, Ash Grove Lime & Portland Cement Co., Springfield, Mo.
Swessinger, E. C., Kelley Island Lime & Transport Co., Cleveland, Ohio.
Stockett, J. W., Jr., N. L. A., Washington, D. C.
Stauffer, S. W., J. E. Baker Co., York, Penn.
Snedeker, Geo. H., Brooklyn, N. Y.
Stiles, R. B., Jr., Merion Lime & Stone Co., Norristown, Penn.
Saumevicht. E., International Clay Mach. Co., New York City.
Towles, R. C., N. L. A., Washington, D. C.
Thoenen, Jr., Greenville, Oho.
Tyler, Chaplin, Chemical and Metallurgical Engineering, New York City.
Tome, Richard E., Maryland Calcite Co., Texas, Md.
Underwood, J. E., N. L. A., Washington, D. C.
Underwood, Mrs. J. E., Washington, D. C.
Urschel, G. C., Woodville Lime Products Co., Toledo, Ohio.
Urschel, J. J., Woodville Lime Products Co., Toledo, Ohio.
Vanderpool, O. J., New York City.
Witmer, David M., Steacy & Wilton Co., Hanover, Penn.
Wilton, F. M., Steacy & Wilton Co., Wrightsville, Penn.
Withrow, James R., Ohio State University, Columbus, Ohio.
Warner, Irving, Charles Warner Co., Wilmington, Del.
Wyman, E. B., Union Lime Co., Los Angeles, Calif.
Wood, Geo. B., Rockland & Rockport Lime Corp., Rockland, Me.
Wood, Mrs. Geo. B., Rockland, Me.
Washburn, D. E., American Lime & Stone Co., Bellefonte, Penn.
Wertel, F. J., National Mortar & Supply Co., Gibsonburg, Ohio.
Willis, Gordon, Peerless White Lime Co., St. Louis, Mo.
Warner, Charles, Charles Warner Co., Wilmington, Del.
Walsh, E. J., Round Rock White Lime Co., Round Rock, Texas.
Zorn, F. W., National Mortar & Supply Co., Gibsonburg, Ohio.

Plant That Makes Brick Sand

Croton Sand and Gravel Corporation Has a Unique Market

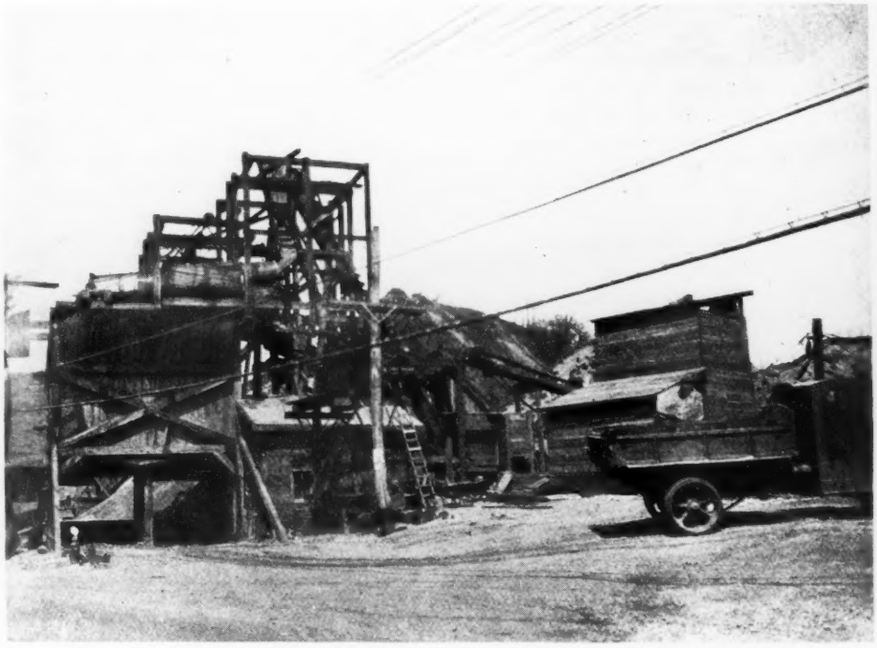
THE Croton Sand and Gravel Corp., which has its plant and main office at Croton-on-Hudson, about 30 miles above New York, has a market for its product that is almost unique in the sand and gravel industry. Practically all of the sand which it produces is used in the making of clay brick.

The plant is situated just across the river from what is possibly the greatest brick making district in the world. The brick plants at Haverstraw and the towns nearby produce many millions of brick each year, which are shipped down the Hudson not only for the New York market but for the markets of many other towns and cities which can be reached by water. These brick are made of clay, but the clay mixture must contain about 20% of sand in order to maintain its shape in burning, and much of this sand comes from the Croton plant. As the brick yards it supplies either wholly or in part produce from 7,000,000 to 8,000,000 brick per day, it can be seen that this market is an important one.

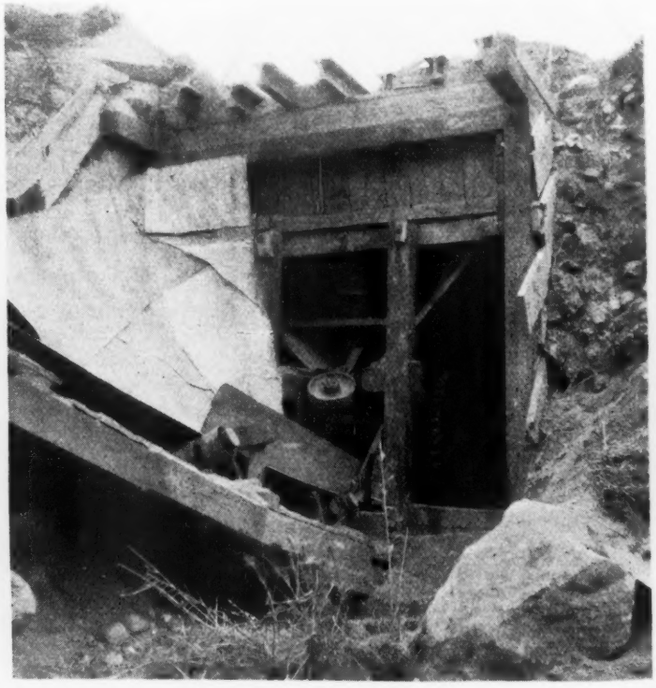
Some brick makers produce their own sand, but the large producers prefer to buy the sand from a regular sand producer on account of its uniformity. Clay in the sand is no detriment, but the clay content must be uniform and some brick makers would rather have washed sand on that account.

Aside from the interest this plant has on account of its unusual market, it is an interesting plant on account of its design and the efficient method of operation. The deposit is in the high bluffs which rise from the river bottom at that point. They are so high that the greater part of the deposit is above the plant, which makes it very convenient for a scraper bucket operation. In fact, one could hardly imagine an operation better adapted to this method of excavation.

The bucket is a 2-yd. Sauerman of crescent form. The hoist which runs it is a Sauerman special scraper hoist and it is installed in an interesting way. As is shown by the picture, the controls go up through the floor of a platform directly above the hoist on which the operator stands. Lever



Plant of the Croton Sand and Gravel Corp., near Croton-on-Hudson, N. Y.



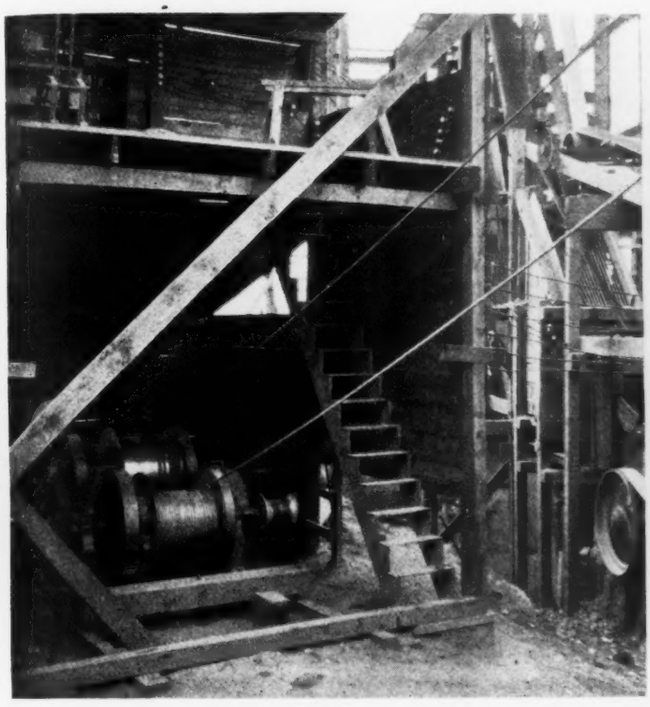
Left—The crescent type of scraper bucket on the return trip. Right—Hopper (with rails above) and feeder. The bank material brought in by the bucket falls through the rails to the hopper

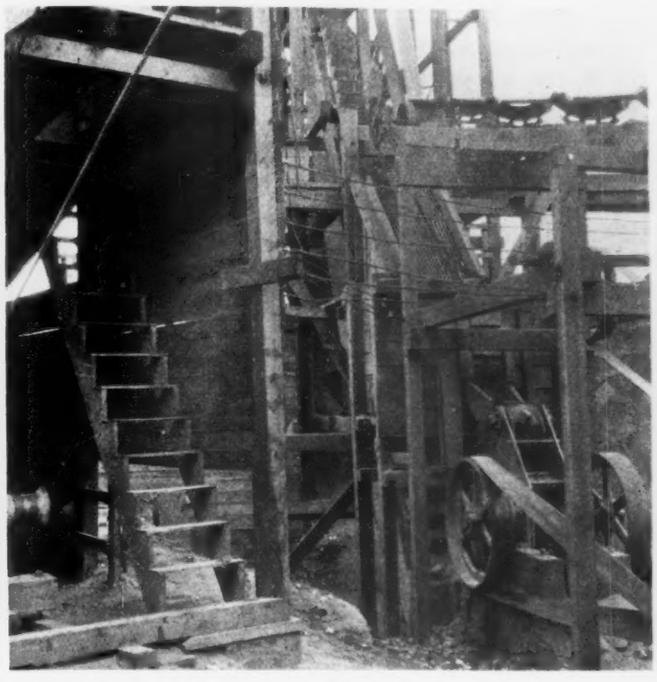
switches and starting box are on this platform.

The bucket has no bottom and its load drops through a grizzly of railroad rails at the end of the run. There is a small hopper below into which the material falls and from this it is fed to the plant belt by a Robbins feeder. The rails above are set 6 in. apart and their function is principally to distribute the load of the bucket.

The conveyor discharges directly upon another grizzly of light rails set with 2-in. spaces. Everything that passes goes to the boat of the plant elevator and the oversize falls into a small bin or pocket, which has a chute to the jaw crusher and a gate by which the feed to the crusher may be regulated. This is a good bit of design on account of its simplicity and the small amount of headroom that it takes.

The product of the crusher and the undersize of the grizzly are taken by the plant elevator to the screens. There are two of these, 18 ft. long and 53 in. in diameter. Water is added at the screens. The gravel falls into bins and the sand goes to two sand boxes, which deliver the sand to a





Left—The scraper hoist. The operator stands on the platform above. Note controls in upper left-hand corner of picture. Right—Arrangement of conveyor grizzly and crusher mentioned in the text

Left—The belt connecting the plant with the dock passes under the highway through the tunnel shown. Right—The pump house. Pipes go through the same tunnel from the pump house to the plant

stockpile or to the conveyor belt by which it is loaded into barges. The crusher, screens and sand boxes were made by the Good Roads Machinery Co.

For handling sand in and out of storage there is a stiffleg derrick which is powered by a Legerwood hoist with three drums and swing gear.

The gravel is shipped by truck, principally for highway work. The sand which is to be used at the brick plants is loaded by an 18-in. conveyor belt that passes under the concrete highway, which is between the plant and the river and then out to a dock, where there is a small hopper with swinging chutes on both sides by which the sand is loaded into barges. This belt and the other conveyors and elevators were built by the Robbins Conveying Belt Co. Manhattan 5-ply belts with ⅛-in. rubber cover are used and the belt to the dock delivers 210 tons per hour.

The pumping plant is on the same side of the highway as the dock and it contains a 5- and a 6-in. Worthington centrifugal pump. The discharge pipes pass through the same tunnel that the loading belt passes through. One pump has a 20 hp. Wagner motor and the other a Westinghouse motor of the same power. A 25 hp. Allis-Chalmers motor is used on the screens. There are five other motors on the plant, all of General Electric make, operating the hoisting, excavating and conveying machinery.

The office of the Croton Sand and Gravel Corp. is at Croton-on-Hudson. T. M. Dwyer is president and manager of the company, A. C. Perrault is secretary and Joseph T. Palamara is treasurer. Joseph McCullough is plant superintendent.

Union Rock Company Largest in Gravel Industry

GEORGE A. ROGERS, president of the Union Rock Co., has just reported that the Union Rock Co. with its subsidiary, the American Crushed Rock Co., are the largest producers and distributors of crushed rock, sand and gravel in the world. The figures were supplied by the National Sand and Gravel Association.

Mr. Rogers states that his company produced and sold 3,700,000 tons of materials in 1924, or the equivalent of 76,000 carloads. Seventy-six thousand cars, placed end to end, would make a train from Los Angeles to San Francisco and return.

The company paid the railroads over $2,000,000 in freight in 1924 and are said to be the largest shippers on the Pacific coast. It is interesting to note that the entire freight movement out of the Imperial valley for 1924 was 36,267 cars, which was less than half the tonnage of this giant industry.

Mr. Rogers states that business conditions are excellent with his company and indications so far this year show that the Union Rock Co. business will probably exceed 4.000,000 tons for 1925—*Los Angeles (Calif.)*

National Meeting of the Blue Diamond Mortar Producers

THE first annual meeting of the manufacturers of wet-mixed lime mortar under the Blue Diamond process was held at Briarcliff Lodge, Westchester county, New York, on May 27, 28 and 29. Wm. C. Hay, president of the Blue Diamond Co., Los Angeles, Calif., and inventor of the process, was present, as was also C. M. Cadman, a San Francisco pioneer in the wet-mixed lime mortar business under the Hay patents.

The meeting consisted largely of a free and open round-table discussion of some of the common problems, particularly various lines of sales resistance and the best methods of overcoming such resistance. The main point brought out was that wet-mixed lime mortar made by this process, with the service that the Blue Diamond Co. of Los Angeles has featured, is more than the mere marketing of a building commodity. It is the selling of an improvement in building operations which eliminates at least one operation and assures a uniform, satisfactory material.

Insure Proper Use

In promoting the use of wet-mixed Blue Diamond mortar it has been found desirable for best results to have expert plasters as inspectors and promotional men. These men can insure satisfactory treatment of the material after it arrives on the job. The selling of wet-mixed mortar and plaster puts the responsibility for satisfactory results directly on the shoulders of the manufacturer of the mortar. If the mortar is mixed from the various ingredients on the job, there is always a loophole to escape responsibility on the part of any material man, but in the case of wet-mixed mortar the responsibility for the mortar and plaster, even in place, of course, falls largely on the manufacturer of the mortar.

This phase of the business is undoubtedly one of the best reasons why wet-mixed mortar quickly wins recognition from prominent architects and engineers. They fully appreciate the difficulty of getting satisfactory workmanship on the job, and readily appreciate the probability, if not certainty, of vastly better results from machine-mixed mortar made under constant scientific control. One ever present difficulty is to prevent plastering contractors from "skinning the job" and thus getting results not satisfactory to any one concerned.

Literature to Be Prepared

K. M. Grier, advertising manager of the Blue Diamond Co., Los Angeles, Calif., prepared a plan for the co-operative preparation and use of booklets and other publicity material, which was adopted. The sum of $15,000 was pledged by those present to start this work.

Blue Diamond mortar plants are now in operation at Los Angeles, San Francisco, Oakland, San Diego, Fresno and Glendale, Calif.; Denver, Colo.; Dallas, Texas; Kansas City, Mo.; Cleveland, Ohio; Atlanta, Ga.; Philadelphia, Penn.; Boston, Mass., and Montreal, Que.

A list of those at the meeting is as follows:

W. C. Hay, Blue Diamond Co., Los Angeles, Calif.
Chas. M. Cadman, Atlas Mortar Co., 58 Sutter St., San Francisco, Calif.
John Prince, Stewart Sand Co., American Bank Building, Kansas City, Mo.
W. H. Hastings, Blue Diamond Materials Co., 40 Court St., Boston, Mass.
Alex Bremner, c/o Alex Bremner, Ltd., Montreal, Canada.
E. E. Lepine, Standard Lime Co., Ltd., Joliette, Que.
Alexander Foster, Jr., West Jersey Sand & Supply Co., Delaware Ave. and Marlboro St., Philadelphia, Penn.
Charles Shomaker, West Jersey Sand & Supply Co., Delaware Ave. & Marlboro St., Philadelphia, Penn.
L. H. Sturtevant, Sturtevant Mill Co., Harrison Square, Boston, Mass.
W. T. Doyle, Sturtevant Mill Co., Harrison Square, Boston, Mass.
John Truby, Marion Building, Cleveland, Ohio.
Mr. Tuttle, Blue Diamond Material Co., Boston, Mass.
J. F. Sutherland, Blue Diamond Mortar Co., Atlanta, Ga.
Wm. F. Campbell, Blue Diamond Service Corp., New York City.
A. P. McCallie, Blue Diamond Service Corp., New York City.

Missouri Highway Department Offers Gratis Limestone To Farmers

THE Missouri State Highway Department along with producing crushed stone for its road construction intends to compete with crushed stone producers by offering its pulverized limestone to farmers. A news dispatch from the state capitol in the *Popular Bluff (Mo.) Republican* reads as follows:

Farmers in many sections of Missouri will be able to procure pulverized limestone in large quantities as a result of the present state highway building program, it was stated at the Highway Department recently. The state, it was explained, now operates a number of large rock crushers in various parts of Missouri where limestone rock is crushed for highway construction.

The limestone meal or dust is a soil neutralizer, but due to high freight rates, it was said, it cannot be transported to distant markets at a profit. Every rock crusher being operated on the state's roads, highway officials said, is accumulating a large pile of dust, which will be given free to farmers who will haul it away from the crusher.

The offer on the part of the Highway Department to provide farmers with free limestone dust is expected to be accepted by a large number of farmers.

Gravel Aggregate in Concrete Roads

National Sand and Gravel Association Holds Committee Meeting in Philadelphia with Highway Materials Experts

A MEETING of far-reaching importance to the mineral aggregate industries was held in Philadelphia, June 3, under the auspices of the National Sand and Gravel Association. Producers were present from Pennsylvania, New York, Maryland, New Jersey and Delaware and the question discussed was "Why is gravel excluded as a coarse aggregate in first-class concrete roads by the Pennsylvania and New York state highway departments?"

John Prince, president of the National Sand and Gravel Association, Kansas City, Mo., presided, and made an illuminating and happily worded opening address. He stated that the producers had come with entirely open minds to learn. They were willing to grant that New York and Pennsylvania may have had unsatisfactory experience with gravel concrete, but they believed that gravel could be supplied which would be satisfactory. They were there for a free, open and frank discussion of all the problems involved.

F. H. Jackson, engineer, U. S. Bureau of Public Roads, Washington, D. C., was first introduced. He said concrete pavements cost from $15 to $18 per cu. yd. He listed causes of failure as follows: (1) Temperature changes; (2) moisture changes; (3) deterioration from alternate freezing and thawing; (4) effects of traffic, (a) compression, (b) bending. There are thus many causes of failure other than those contributed by traffic conditions.

Mr. Jackson listed necessary properties of aggregates thus: (1) Structurally sound; (2) must not contribute to scaling (although the cause of scaling is not definitely determined); (3) resistance to wear (where tire chains are used this is important); (4) cleanliness; (5) well graded, so as to make a workable mixture of concrete as well as insuring strength. In comparing different aggregates he said compressive strengths were of little value, there was small difference as between stone and gravel; in the case of tensile strengths he thought there was a difference. As the result of an extensive survey of concrete roads he was convinced there was less cracking in stone-aggregate roads than in gravel-aggregate roads. In the matter of wear there was practically no difference.

Pennsylvania Attitude Explained

H. S. Mattimore, engineer of tests, Pennsylvania state highway department, then stated briefly the attitude of his department toward the use of gravel aggregate in primary concrete highways. (Its suitability for secondary roads is conceded. The difference between primary and secondary roads is the amount of traffic contemplated.)

Mr. Mattimore said that the Pennsylvania state highway department had built a test road using a specially prepared subgrade, so as to make all conditions comparable, a part of which was constructed with stone aggregate, and a part with gravel aggregate. He said the ratio of cracks in the gravel concrete as compared to the stone concrete was 7 to 1. His principal criticism of gravel was the lack of uniformity, even from the same pit. Upon questioning, Mr. Mattimore said neither he or anyone else could say definitely what caused the cracks.

Hugh Haddow, Jr., who heads committee of sand and gravel producers that will make a thorough-going investigation of gravel aggregate for concrete roads

At this point Alex W. Dann, vice-president and general manager of the Keystone Sand and Supply Co., Pittsburgh, Penn., was called upon. He stated the case of the Pennsylvania gravel producers in a most friendly but forceful way. He said that they had several million dollars invested in producing plants, and that as citizens and tax payers they want to see the state's road money expended to the best advantage. They were willing to give every consideration to quality, and did not want any inferior material used in the state's highway system. But he did believe good gravel could be commercially prepared that would be satisfactory to all concerned.

Longitudinal vs. Transverse Cracks

Mr. Dann had also inspected the test road under discussion. He had observed the same conditions in regard to cracking as Messrs. Jackson and Mattimore. But he had also observed that there were considerably more longitudinal cracking in the stone aggregate section than in the gravel section. He did not necessarily blame the aggregate, but believed it merely illustrated the incompleteness of our knowledge as to the cause of cracking in concrete pavements.

At this point P. J. Freeman, materials engineer of Allegheny County, Pittsburgh, Penn., volunteered the information that he had conducted Mr. Dann's inspection trip for the purpose of demonstrating the superiority of stone aggregate; and that he was a little "disappointed" in finding the above mentioned longitudinal cracks, which, he was sure had made their appearance during the past six weeks. However, Mr. Freeman defended the use of stone aggregate on the ground that even with proper specifications it was impossible to get uniformly good gravel continuously, and that rejections were bound to be more than in the case of stone.

New York State Case

W. L. Blaun, testing engineer, New York State Highway Department, stated that his department *had not excluded* the use of gravel aggregate, but that the Highway Commission had recently gone on record as against the use of gravel on primary roads. He said as to costs of construction there was only 3% difference in favor of the use of gravel, on an average, when considering the concrete in place on the road.

Mr. Blaun listed the defects of gravel as follows: (1) cannot be obtained in specified sizes, the larger sizes are generally lacking; (2) it is generally dirty; (3) transverse cracks in gravel concrete are more numerous than in stone concrete; (4) river and glacial gravels differ widely in ingredients; much gravel contains shale which disintegrates in the concrete; (5) the percentage of flat pieces is large; (6) can not discriminate against local materials, and can not get specifications which will insure satisfactory local materials.

Mr. Blaun's last point is rather interesting. He objected to the use of gravel because the highest court in the State of New York has ruled that the highway department can not compel a contractor to use com-

mercial materials if a local material is preferred and can be gotten by the specifications. Hence in order to rule out unsatisfactory local gravels, the inference was, the highway department had found it expedient to rule out *all* gravel.

New Jersey Concrete Roads

Hugh Haddow, Jr., vice-president and general manager of the Menantico Sand and Gravel Co., Millville, N. J., said that all the concrete roads in the southern half of New Jersey were built of gravel produced in Pennsylvania. He said the New Jersey State Highway Department had never attempted to bar gravel, but on the other hand had extended the fullest co-operation to producers in helping them to produce a high grade material. He thought that this proved good concrete roads could be built of gravel concrete. It was true that success in the use of gravel was due to well prepared gravel. The Pennsylvania gravels used are mostly of glacial origin.

Sand and Gravel Association to Have Engineering Department

President John Prince then announced that an engineering department was about to be added to the National Sand and Gravel Association, the object of which will be to co-operate in the solution of just such problems as that under consideration.

Economic Features of Problem

J. P. Price, of the Wyoming Sand and Stone Co., Wilkes-Barre, Penn., presented some thoughts on the economic considerations involved. He said orders for crushed stone for work in his county were far in excess of the productive capacity of the available shipping plants, that gravel was being wasted to produce sand to use with the stone, which would inevitably result in a shortage of both stone and sand. H. S. Davidson, secretary-treasurer of J. K. Davidson and Bro., Pittsburgh, Penn., stated that half of the gravel produced in this district was thrown back into the rivers. It makes the sand costly.

Alex. W. Dann further emphasized this uneconomic condition where it was necessary to waste gravel to supply sand. Sand was now selling at $1.35 per ton as against 85 cents for gravel. Sand is getting constantly scarcer and he could not see anything ahead but higher prices, at least so far as his own operations were concerned.

J. L. Durnell, of the Van Scriver Corporation, Philadelphia, spoke of this same feature of heaping cost on sand, when it should be shared by gravel to be an economically sound operation. He said he did not believe there was a highway department laboratory anywhere more particular in the selection of materials than the New Jersey laboratory; the specifications were by no means easy to fulfill, but the results proved gravel suitable for the best concrete roads could be commercially produced.

Reed C. Bye, manager of the sand and gravel operations of the Charles Warner Co., Philadelphia, speaking along the same lines, said they did not expect the present market for Pennsylvania gravel in New Jersey to last indefinitely. As soon as this outlet for eastern Pennsylvania gravel ceased, the cost of producing the sand alone was bound to increase, he said.

R. C. Fletcher, president of the Flint Crushed Gravel Co., Des Moines, Iowa, explained conditions in Iowa, where gravel is worth a premium for concrete highway work. Mr. Fletcher is also a quarry operator. He said he could see no difference between gravel and crushed-stone concrete on Iowa roads built of his materials. He has to meet very strict specifications. He removes shale from his gravel, although it is occasionally necessary to use picking belts to do it. Iowa specifications rule out poor local materials, he said; if a producer can make his material according to specification, it should not be discriminated against on general principles; if he can not make his material according to specification he should not embarrass the highway authorities by attempting to have it used. He has highway department inspectors at the plant and endeavors at all times to produce satisfactory materials. It is not always easy, he said, but it can be done. He believed it could be done in the East as well as in Iowa.

Edgar L. Wade, Arundel Corporation, Baltimore, Md., told his experience in furnishing gravel for Maryland state highways. He doubted if anyone knew all the causes of cracking in concrete pavements.

Remedies

To bring the results of the discussion to a head, Alex. W. Dann suggested the naming of a committee of interested producers who would work with the state highway authorities in Pennsylvania and New York to find out what is wrong with gravel concrete roads. It was suggested that the National Research Council, or some other equally unbiased authority, be authorized to make an extensive investigation of the whole problem.

Mr. Mattimore (Pennsylvania State Highway Department) thought this a good suggestion and assured the producers that his department was impartial in its attitude. Mr. Blaun (New York State Highway Department) suggested that the producers do enough research work to be able to submit specifications which would insure satisfactory gravel under all conditions, and submit these to the highway departments. Mr. Freeman (Allegheny county) again emphasized the irregularity of gravel, and the importance of the whole study of the disintregation of concrete by all concerned. Mr. Jackson (U. S. Bureau of Public Roads) said his bureau was interested only in seeing the best available materials used; it had no right to interfere with local issues in New York or Pennsylvania.

The meeting ended in the appointment of a committee of two producers from the Pittsburgh district, two from the Philadelphia district, two from New York state, one from Maryland, with Hugh Haddow, Jr., of New Jersey, chairman. With this committee rests the responsibility of devising ways and means of initiating such research work as will convince the state highway authorities of New York and Pennsylvania that as good concrete roads can be built of gravel as of crushed stone.

Those attending the meeting were:

REGISTRATION

Hugh Haddow, Jr., Menantico Sand & Gravel Co., Millville, N. J.
R. C. Fletcher, Flint Crushed Gravel Co., Des Moines, Ia.
P. J. Freeman, Allegheny County, Pittsburgh, Penn.
H. M. Bougher, J. W. Paxson Co., Philadelphia, Penn.
Reed C. Bye, Chas. Warner Co., Wilmington, Del.
W. L. Blaun, New York State Highway Dept., Albany, N. Y.
J. L. Durnell, Van Sciver Corporation, Philadelphia, Penn.
H. C. Dilliard, Washed Sand & Gravel Co., East Bangor, Penn.
H. S. Davison, J. K. Davison & Bro., Pittsburgh, Penn.
Alex W. Dann, Keystone Sand & Supply Co., Pittsburgh, Penn.
D. C. Elphinstone, Iron City Sand & Gravel Co., Pittsburgh, Penn.
W. W. Gulick, W. W. Gulick Sand Co., Danville, Penn.
J. A. Heim, Lycoming Silica Sand Co., Montoursville, Penn.
Carl F. Hermann, Salem Sand & Gravel Co., Wilkes-Barre, Penn.
F. H. Jackson, U. S. Bureau of Public Roads, Washington, D. C.
H. S. Mattimore, Penn. State Highway Dept., Harrisburg, Penn.
D. J. Miller, Portland Sand & Gravel Co., Portland, Penn.
John Prince, Stewart Sand Co., Kansas City, Mo.
J. P. Price, Wyoming Sand & Stone Co., Wilkes-Barre, Penn.
C. C. Patterson, Iron City Sand & Gravel Co., Pittsburgh, Penn.
Horace G. Reeder, Delaware River Sand & Dredg. Co., Bordentown, N. J.
W. M. Rehrig, Ashfield Sand Co., Ashfield, Penn.
N. C. Rockwood, Rock Products, Chicago, Ill.
J. M. Settle, Ohio River Sand Co., Louisville, Ky.
H. J. Stannert, H. J. Stannert Sand Co., Northumberland, Penn.
J. H. Van Sciver, Van Sciver Corporation, Philadelphia, Penn.
George D. Van Sciver, Van Sciver Corporation, Philadelphia, Penn.
George H. Williamson, J. K. Davison & Bro., Pittsburgh, Penn.
Edgar L. Wade, Arundel Corporation, Baltimore, Md.
H. H. Witmer, J. C. Budding Co., Lancaster, Penn.
John C. Munty, Chas. Warner Co., Philadelphia, Penn.
Louis Levin, Chas. Warner Co., Philadelphia, Penn.
R. F. Brown, Philadelphia Transport & Lighterage Co., Philadelphia, Penn.

Canada Crushed Stone Expands

THE Canada Crushed Stone Corporation, Ltd., with head office at Hamilton, Ont., and quarries at Dundas, Hagersville, and Vinemount, has recently acquired the Queenston Quarries, Ltd., Queenston, Ont. The Queenston company have been operating two quarries, one near St. Davids producing building stone, and the other crushed stone for construction purposes. These quarries have been in operation for almost 100 years.

The new owners are making a number of changes in the equipment and plant at Queenston and will be in position in the very near future to render improved service to customers.

Kansas Portland Cement Company Plant

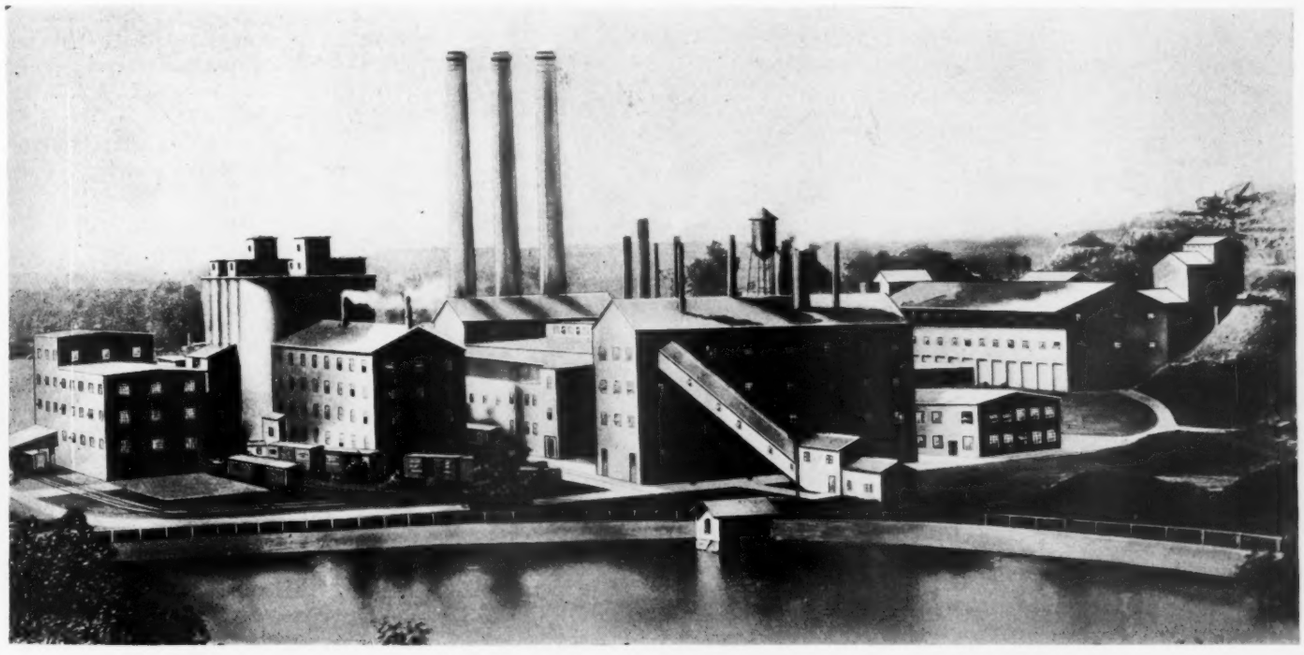
New Plant on Site of Old Bonner Plant at Bonner Springs, Kansas, One of Most Modern Wet Process Plants in Country

IN January, 1923, the International Cement Corp., New York City, secured by purchase, the entire plant and holdings of the Bonner Portland Cement Co., located near Bonner Springs, Kan., approximately 17 miles west of Kansas City, Mo. A new company was formed under the laws of Kansas called The Kansas Portland Cement Co., and the brand of cement was changed to "Sunflower" brand.

The old plant being a dry-process plant and the equipment obsolete, the new owners, in accordance with the International system, decided to erect a modern wet-process plant on the site of the old plant. Engineering work was immediately started and actual construction work was begun September 1, 1923. The construction work was carried through as fast as weather conditions would permit with the result that the new plant was ready for operation in the early part of July, 1924, and has been in successful operation since. The capacity of the plant is approximately 3000 bbls. daily. Steel and concrete construction has been used throughout.

The raw materials used for manufacturing are limestone and shale, which are secured from the quarry located just a few hundred feet west of the plant proper, the material being dug by steam shovels from different benches. The raw materials are transported to the crushing plant from the quarry by locomotives and 5-ton side-dump cars.

The crushing plant is located on the side of a hill, where the raw materials are dumped from the cars into a 36-in. Fairmount roll crusher, discharging directly on to an inclined pan conveyor, which again discharges into a Pennsylvania hammer mill. The hammer mill discharges directly into the rock storage.



Architect's sketch of the new plant of the Kansas Portland Cement Co., Bonner Springs, Kans.

The rock storage is built of concrete, with superstructure of steel, stucco walls and corrugated zinc roof. It is provided with an 8-ton Milwaukee overhead electric traveling crane, which is used to distribute the raw material over the storage and also to reclaim it as needed.

The rock storage is provided with a tunnel in which runs an inclined belt conveyor; this belt conveyor receives the raw materials from spouts underneath the rock storage and discharges them into bins in the raw mill.

The Raw Mill

The raw mill consists of two units, each unit consisting of one No. 85 F. L. Smidth wet kominuter and one No. 18 F. L. Smidth tubemill. An additional kominuter is now being installed. The kominuters are driven by 125-h.p. motors and the tube mills by 250-h.p. motors, the motors being of the General Electric super-synchronous type.

Water is added to the raw materials as they are fed to the kominuters, which discharge into a bucket elevator carrying the material to a Trix separator. The separator discharges the material into an agitating trough from whence it is fed into the tube-mills for final grinding. After receiving the final grinding, the raw material, now slurry, is carried by a bucket elevator and piped to the correcting basins.

The slurry basins are located in the kiln room underneath the feed end of the kilns. There are three correcting basins and three slurry storage basins. By an ingenious system of bucket elevators and distributing pipes, it is possible to carry the contents of any of the basins to any of the other basins, thereby enabling the chemist to properly mix the slurry, thus giving assurance of an absolutely uniform mix. While stored in the basins the slurry is continuously agitated by triple sets of agitating arms.

Screws and Elevators for Slurry

From the slurry storage bins the slurry is carried by means of screw conveyors and bucket elevators to a kiln feed trough,

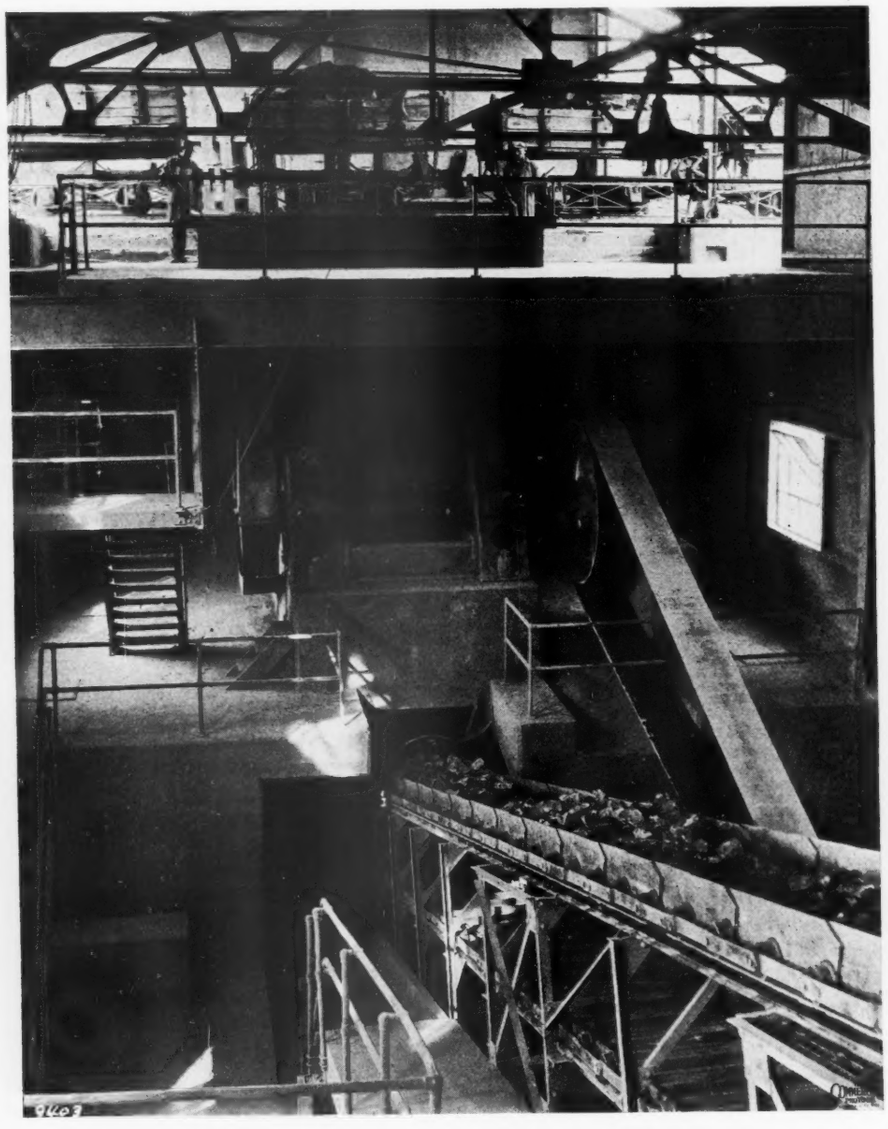
View of quarry operation

Transportation methods quarry to plant

from which ferris wheels discharge the slurry into the kilns. There are three ferris wheel feeders, each driven by 3-h.p. motor through James worm gear speed reducers.

There are three rotary kilns, 9 ft. in diameter at the burning zone and 8 ft. from there on. The length is 220 ft. The kilns are connected through dust chambers to three concrete chimneys 200 ft. high. The kilns are driven by 50-h.p. induction motors through Link-Belt silent-chain drives.

The hot clinker is discharged from the kilns directly into coolers, there being an individual cooler for each kiln. The coolers are 8 and 6 ft. in diameter and 78 ft. long, and are equipped with lifting paddles for properly cooling the clinker.



Initial crusher and pan conveyor delivering to hammer mill

A New Type Conveyor

The coolers discharge the clinker into an F. L. Smidth shaker conveyor which is something new in cement mill practice in this country, although these conveyors have been used in other countries with great success for some time. The conveyor, shown in one of the accompanying photographs, discharges to a bucket elevator, through which the clinker is passed through a clinker scale which automatically operates an electrically controlled gypsum scale, through which process the proper proportion of gypsum is added. The bucket elevators mentioned, in connection with a belt and screw conveyor system, convey the combined clinker and gypsum to the finish mill.

Finish Mill

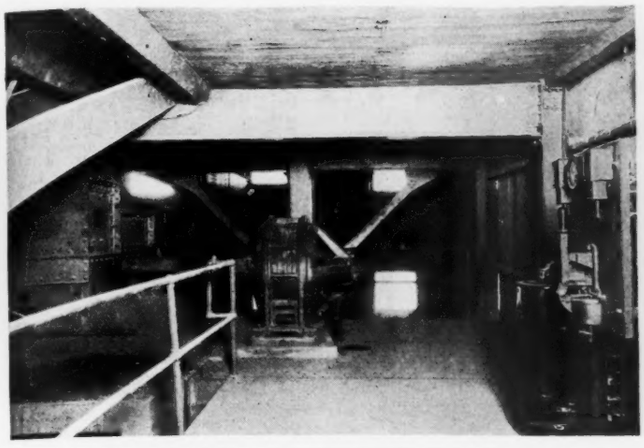
The finish mill consists of seven "Giant Griffin" mills, (space having been provided for eight mills) operated by 75-h.p. vertical motors and two Allis-Chalmers tube-mills. The Griffin mill installation is equipped with two cyclone dust collectors, which has proved a very satisfactory installation, as dust is noticeably absent at this plant. The tube-mills are driven by 400-h.p. General Electric super-synchronous motors.

Finished cement from the tube-mills was formerly conveyed to the warehouse by elevators and conveyors but this equipment is being replaced now by two Fuller-Kinyon pumps which will convey cement directly to the warehouse.

For the burning process pulverized coal is being used. Slack coal from nearby mines is used and is generally secured in hopper bottom cars which discharge directly into a pan conveyor located beneath the tracks. Provision has been made also to handle coal from the cars by locomotive crane when necessary.

Coal Mill

The pan conveyor discharges the coal into a Jeffrey coal crusher, from which it is taken by an inclined belt conveyor to the coal mill building and discharged into bins



Secondary crushing unit—hammer mill—with 250-h.p. motor and control apparatus

Bin hoppers, feeders and kominuters in the raw mill—Note pipe returns from Trix separators

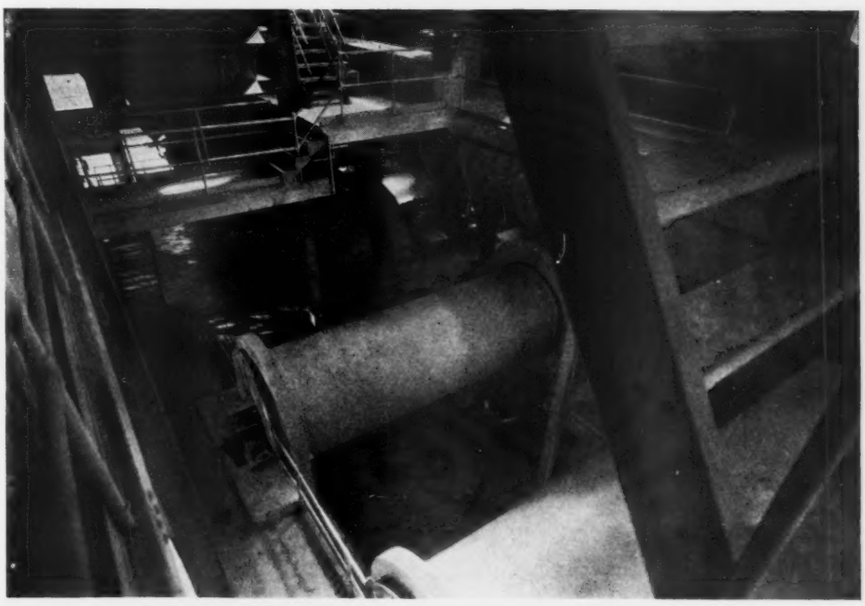
over two Ruggles-Coles coal dryers. The dryers are driven by 20-h.p. motors through Jones gear reducers. From the dryers the coal is taken by bucket elevators and screw conveyors to four Fuller mills which are used for pulverizing. The pulverized coal is then taken by screw conveyors and bucket elevators to the kiln coal feed bins, whence it is fed to the kilns. The coal mill is equipped with a cyclone dust collector system, thus eliminating dust in this department.

Storage and Packing Plant

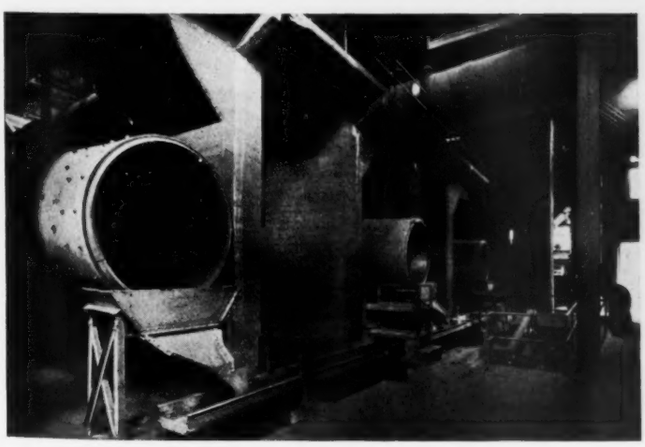
The warehouse is of reinforced concrete silo type, consisting of six silos 32 ft. in diameter, 80 ft. high, with six interspace bins, making 12 bins in all, with a total capacity of approximately 110,100 bbls. Construction work on an additional silo warehouse of similar size has just been started.

The cement is reclaimed from the warehouse by a screw conveyor system, and by means of bucket elevators and overhead screw conveyors is carried to the bins above the packing machines. Fuller-Kinyon pump equipment will be installed in the additional warehouse for conveying the cement to the packing house.

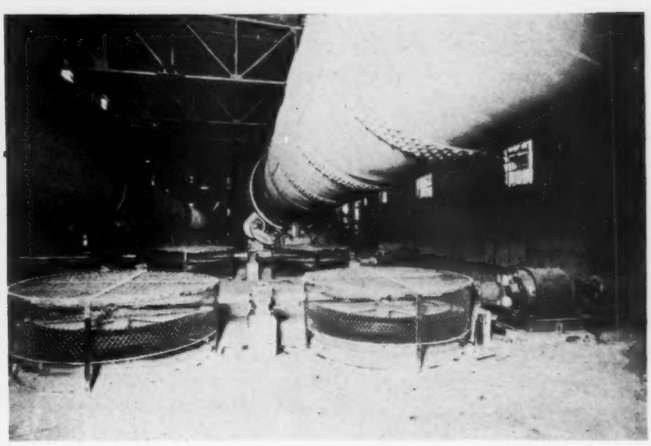
In the packing house is a battery of four Bates four-tube packing machines. These packing machines are equipped with Sly dust collectors which keep the room entirely free from dust while the machines are operating. The packing machines discharge directly on to belt conveyors which take the bags of ce-



Looking down on raw-grinding mills and kominuters



The three coolers discharge to a "shaking" conveyor, which discharges clinker to a bucket elevator—The conveyor is new to the American cement industry



Slurry agitators under the kilns. There are three correcting basins and three storage basins interconnected with bucket elevators

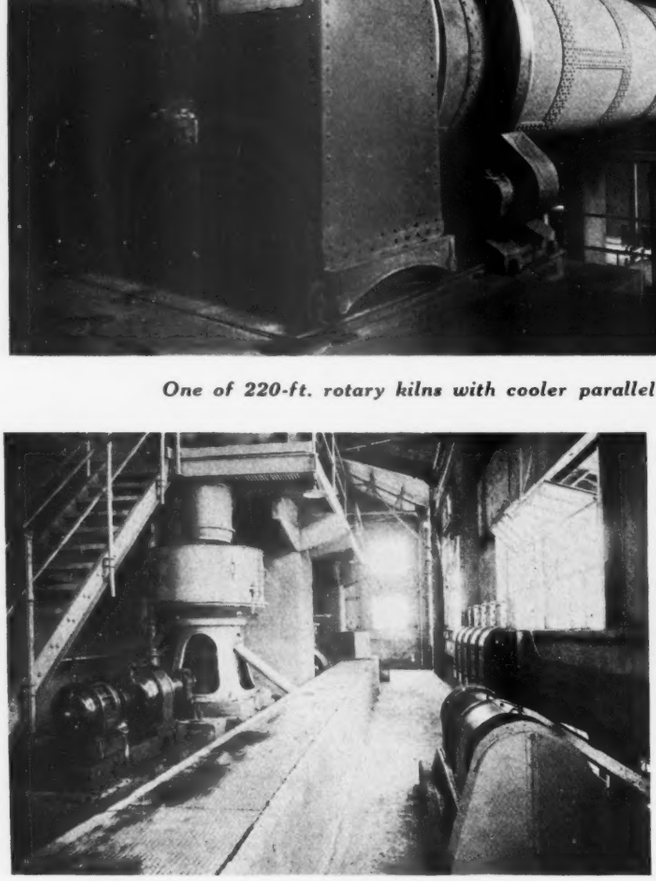
One of 220-ft. rotary kilns with cooler parallel below

ment to cars on either side of the packing house. Provision has also been made for loading trucks.

In one end of the packing house building is located the sack storage and sack cleaning and handling equipment. The empty sacks as they are returned from the trade are cleaned by a sack cleaning wheel which is also equipped with a Sly dust collector. The sacks are discharged on to a belt conveyor which takes the empty sacks to the second floor, where the sorting takes place. The sacks are tied on the upper floor and are delivered directly to the packing machines through chutes.

Shipping Facilities

The plant has excellent trackage facilities. There are two tracks located on each side of the packing house. Empty cars are stored in one end of the plant yards and as they are needed for loading are dropped down by gravity to the packing house and after being loaded are dropped down further by gravity where they are picked up by switch engines of the transportation companies.



Trix separator on slurry grinding mills

A 50-h.p. induction motor and silent chain drive

Battery of seven Griffin mills for preliminary grinding of clinker

The plant is located on the lines of the Union Pacific and Santa Fe railroads, also the Kansas City, Kaw Valley and Western railway, an electrically operated railroad. It is also located on what is known as the "Golden Belt Highway," one of the main arteries leading west out of Kansas City.

The power used in operating the plant is purchased from the Kansas Electric Power Company, being brought into the plant at 33,000 volts and stepped down by a transformer station to 2200 volts. It is distributed to the various departments of the plant at 2200 volts and all large motors are being operated at 2200 volts. The smaller motors are being operated at 440 volts, individual transformer stations being placed in each department for stepping down the voltage from 2200 to 440 volts.

Special Electrical Equipment

The switchboard is of the very latest de-

sign, being furnished by the General Electric Co., as were all the motors throughout the plant.

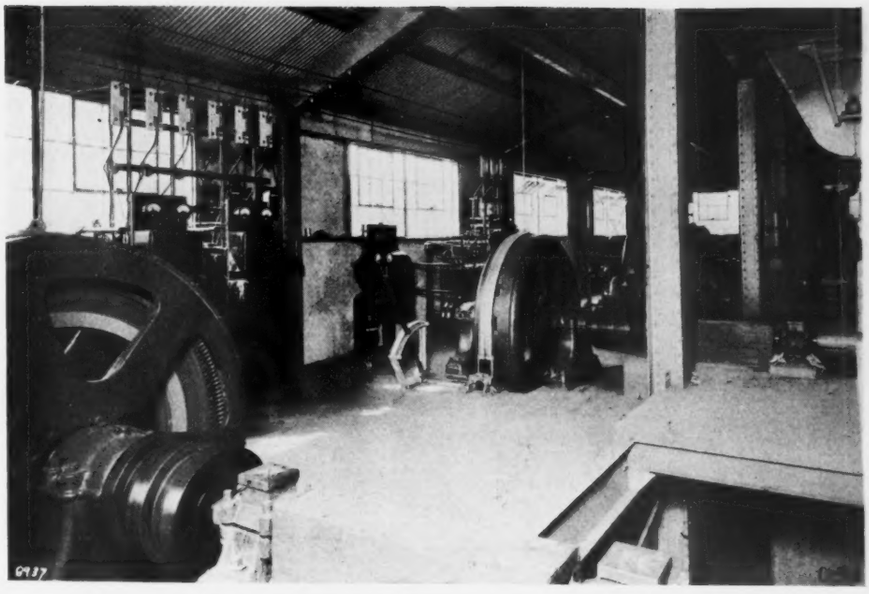
In designing the plant, particular attention was paid to the power feature and each individual machine is driven by its own motor. These motors are all designed for the particular work of each machine or device. Of particular interest are the super-synchronous motors, of which there are five in the plant. All other motors are also either direct connected to the machines or connected to speed reducers and, with the exception of the Griffin and Fuller mills, there are practically no belt drives in the entire plant. In cases where it was impractical to use direct connections, silent-chain drives of the Link-Belt type have been applied. In every instance the needs of the machine were studied and the drive best adapted for the purpose was selected. All spur-gear reducers were supplied by the W. A. Jones Foundry and Machine Co., and all worm gear reducers by the D. O. James Manufacturing Co.

The company has its own water plant, a deep well, capacity 500 gal. per min., having been provided. The water is being pumped from the well direct by an American Well Works 3-stage, deep well turbine type, centrifugal pump.

Machine Shop

In a separate building containing storehouse, machine shop, carpenter and electric shop, there was also provided an adequate service room for white and colored employes. This service room is equipped with all modern conveniences, such as steel lockers, shower baths, Bradley concrete wash fountains, hot water heaters, etc.

The matter of safety has not been neglected—in fact, this plant can well stand as an example of safe practice in designing cement plants. The comfort of the employes has not been overlooked. The dust collectors as mentioned before, make working conditions better for the men, and in addition all gears are guarded, all elevated floors are equipped with hand railings and toe guards, and the electric equipment is well protected and is equipped with every

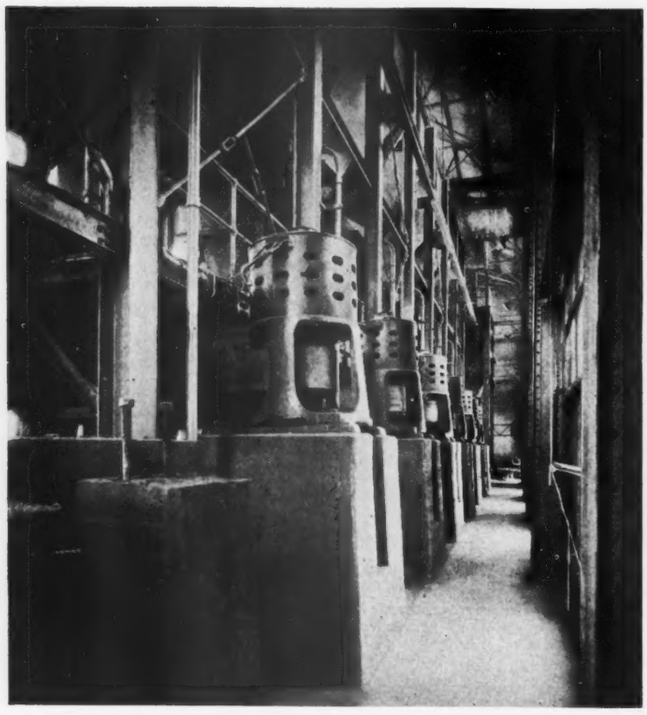


Another view of the super-synchronous motors on tube mills on kominuters

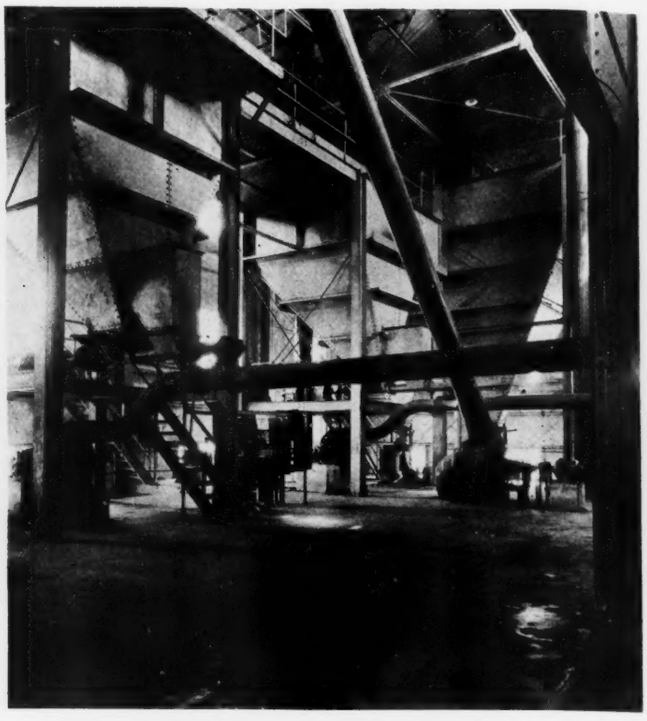
The machine shop—There are also a carpenter shop and a general repair shop

Motors and speed reducers on slurry-feeder drives

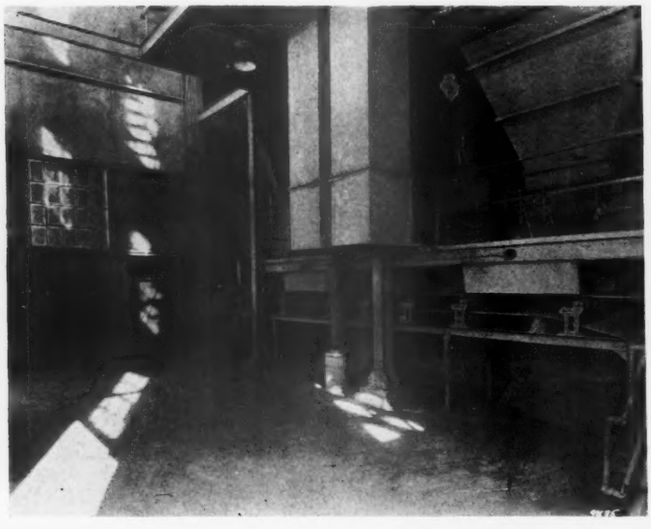
Plant office of the Kansas Portland Cement Co., Bonner Springs, Kans.



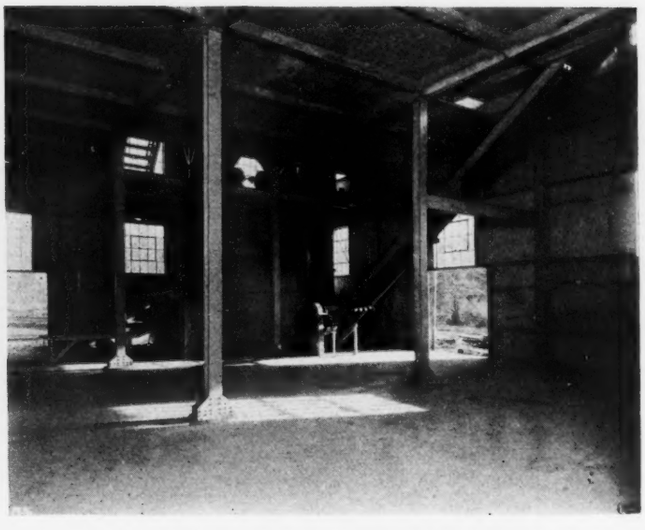
Battery of 75-h.p. motors driving Griffin mills



Pulverized coal bins and feeders

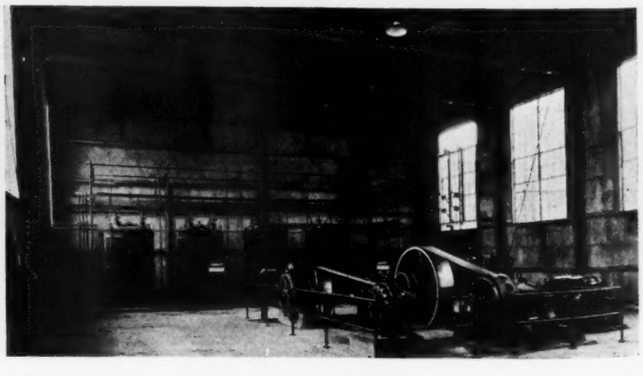


Valve-bag packers with belt conveyor below



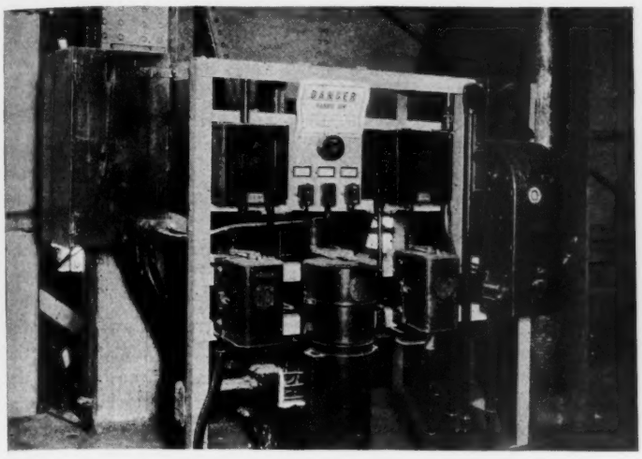
Sack cleaner and belt conveyor for cleaned sacks

Picking table where sacks are sorted—dust collected in background

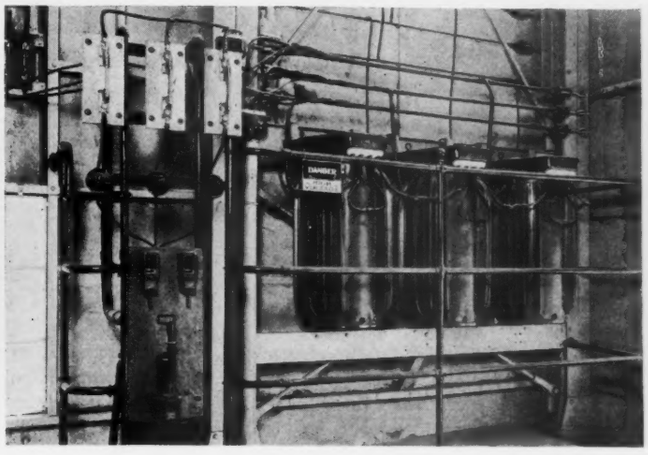


Main transformers for stepping down current from 33,000 v. to 2,200 v.—air compressor

automatic feature that ingenuity can devise. Next to safety comes cleanliness. The entire plant is kept absolutely clean and the machinery is painted in colors that are serviceable and pleasing to the eye.



Centralized control of kilns, slurry feed and coal feed



Transformers and control panel for supplying power to low voltage motors

The general offices of the company are located in the Federal Reserve Bank Bldg., Kansas City, Mo. J. A. Lehaney is vice-president and J. E. Bonnell, resident superintendent. Wm. Moeller is general superintendent. As already noted, the company is a subsidiary of the International Cement Corporation, New York City, of which French R. Bissell is chairman of the board of directors; H. Struckmann, president and general manager.

Controlling Strength of Concrete Without Reference to Fineness Modulus

R. B. YOUNG, who is a laboratory engineer for the Hydro-Electric Power Commission of Ontario, writes in the current *Engineering News-Record* on a method of controlling the strength of concrete without reference to the fineness modulus, surface modulus or voids in the aggregate. His system is extremely simple, consisting, first, of determining the water-cement ratio curve for the materials used (if the job is large enough; otherwise Abrams' curve is used) and, second, in determining by trial and error on the job the mix that will be workable. The sand-gravel ratio for the mix is set after a consideration of the materials at hand, the type of concrete, whether plain or reinforced, the method of placing and other conditions of the job. To this sand and gravel is added cement and water, always maintaining the same ratio of water to cement, to make the mixture as workable as desired. Since the strength of concrete is dependent within wide limits on the ratio of water to cement, and that alone, Mr. Young's method insures that the strength of the concrete continues constant, regardless of changes in the size and grading of the aggregates.

Mr. Young points out that this method satisfies the theoretical requirements of the Abrams method, since the fineness modulus of that method is only a measure of the concrete making qualities of the aggregate, and when the fineness modulus changes the proportion of cement and water must be changed. Hence the same result is arrived at which would have been obtained by following out the complete calculations of that method.

The design of the mixture for a certain strength is only one of the steps in the making of concrete and Mr. Young's paper shows that precise methods of design are not justified unless the means of measuring and combining are accurate. The ordinary volumetric measurements (by which is probably meant measuring by wheelbarrows) may vary 15 to 20%. He rightly stresses the importance of accurate proportioning of the materials, either by weighing or the use of some of the accurate measuring devices such as batchers and inundators. He is quite right in placing uniformity in measuring and proportioning ahead of design, for good concrete may be made from the results of trial and error combinations, but neither this nor any other method will give good concrete if uniformity in proportioning is not maintained.

A point which is well included is that 28 day strength is not the only valuable characteristic of concrete. That it should resist wear, as in road slabs, or be watertight or continue to have a good appearance may be quite as valuable a characteristic under certain conditions and these are things that the designer of concrete mixtures should bear in mind. Mr. Young regards concrete making as a skilled manufacturing process consisting of a number of steps, all of which must be controlled. If other qualities than strength are important it is not safe to be governed entirely by the proportions obtained by calculation, and the engineer should make sure that the proportions set will give the other qualities desired.

In regard to the water-cement ratio, since this is the important thing in this as it is in all other methods of concrete design, Mr. Young has satisfied himself by extensive studies that for the usual variations in materials and for the range of consistencies permitted under modern specifications there is only a moderately small variation in strength for any one value of water-cement ratio and that if the proper water-cement ratio be determined for the different strengths for the average conditions of the job these values are quite reliable unless a radical change in conditions occurs. Abrams' relation he has found reasonably accurate for average well-graded material, but where very fine or very coarse sands are used, it is well to check it experimentally for these materials. On large work it pays to establish the water-cement ratio curve for the materials used as Abram's curve will give such conservatively designed mixtures that a considerable saving may be effected by working out the exact relation for that job. The cost of such work in a commercial laboratory should not exceed $200.

While Mr. Young considers that the fineness modulus has been over-emphasized, and that its use is not necessary to make good concrete, he does not consider it to be valueless. He points out that its real use is the determination of the most economic proportions for the materials under considerations, and while it may not be perfect it gives mixtures nearer the best proportion than the average engineer is liable to obtain by ordinary means. With unusual materials, such as very fine or very coarse sands, neither the fineness modulus nor any other method of proportioning based on average results of many tests can be reasonably expected to apply. For all such cases, he says that experimental determination of the correct proportions is the only safe method.

Verplanck Quarry Plant of the New York Trap Rock Corporation

A Plant Which Is Notable for the Permanency and Solidity of Its Construction as Well as for Its Excellent Design and Equipment

THE Verplanck quarry plant of the New York Trap Rock Corp. is an excellent example of the permanency and solidity with which rock products plants are being built today. This plant takes the place of one which was burned a little over a year ago. The new plant will not burn. It is all steel and concrete and there is not wood enough in it to make a match. Chutes, trestles for belts, machine supports, everything in fact has been made of steel and put up in the most permanent and enduring fashion that the engineer could design.

Moreover, the plant has been designed and built for the expansion of the business. Space has not only been left but all the arrangements have been made for adding to the fine crushing department, which is all that will be needed to bring the present capacity of 3000 tons per day to 5000 tons or even more.

The plant is on the Hudson river some 35 miles above New York and 15 miles below Peekskill. All the product will be shipped by the river and no arrangements have been made for other sort of delivery.

Limestone is quarried here, for the New York Trap Rock Corp., despite its name, is now producing limestone from its various quarries near New York. The quarry has been worked so long that a good face has been developed 50 to 60 ft. in height. But this does not represent the depth of the rock by any means. The strata do not lie horizontally and the floor is carried only at a convenient level. Below it is good limestone which may be taken out some day, provided that too much water should not be encountered in the process. As it is, the quarry makes considerable water, but this is easily handled by the pumps which have been installed.

The ground plan of the plant is like the letter L. The long arm of the L is on the quarry floor and the incline that rises to the level of the river bank, for the floor of the quarry is below the river level. On the river bank are the bins which are on a part of the long arm and on all of the short arm of the L. Above these bins are the fine screens of the plant by which the crushed product is separated into finished sizes. At the end of the short arm of the L is the pulverizing plant to which a part of the screenings will be sent to be ground in a tube mill, while the remainder will be stored for sale in the original condition.

The plant has been building almost from the day after the fire, the pulverizing plant, which was built in only four months' time, being completed first. This is

The bins with the fine screening department above as seen from the Hudson river

The crushing plant. The hopper and primary jaw crusher are at the extreme right; the elevator at the extreme left goes to the fine crushing department which is shown in the picture above. The quarry floor is lower than the river

The jaw crusher in the concrete-lined pit. (Taken during installation)

running on accumulated screenings which are recovered by a steam shovel and hauled to the plant by truck. Meantime work on the main plant has gone on, along with stripping and other preparatory work at the quarry, and it is expected that the plant will be in production some time in June.

The rock will be well-drilled and shot down in the usual way and loaded into 15-ton cars, standard gage, by either Diesel-powered or electrically-powered shovels. The cars will be brought in to the plant by a Woodford electrical haulage system, centrally controlled, operated by 250-volt direct current. This is the same system described in Rock Products for August 23, 1924, as used at the Marble Cliffs quarry at Columbus, Ohio. Only in this case the installation will be simpler and a single operator in the quarry tower (which contains the motor generator set) will be able to control the whole movement of the cars from the time they leave the shovel until they are dumped in the plant hopper. The shovel man handles the cars in and out of the range of his machine.

The cars will be dumped into the hopper of the primary crusher, which is a 48x60-in. Traylor jaw crusher. This is set in a long narrow cut in the quarry, below the level of the quarry floor, which is lined with concrete. It is watertight so that while it is below water level the only water that has to be pumped out is the little that comes from rains. A 48-in. belt will take the discharge of the crusher and convey it to a Robbins Cataract grizzly, which is in the upper part of a building which houses a No. 10 Kennedy gyratory crusher. The oversize of the grizzly falls into the crusher, the undersize goes down a chute to a 42-in. conveyor belt, where it is joined by the crusher discharge and the whole goes to a

The bins, with the fine-screening department above, are on two sides of a square

Looking at the crushing plant in the quarry while construction was going on

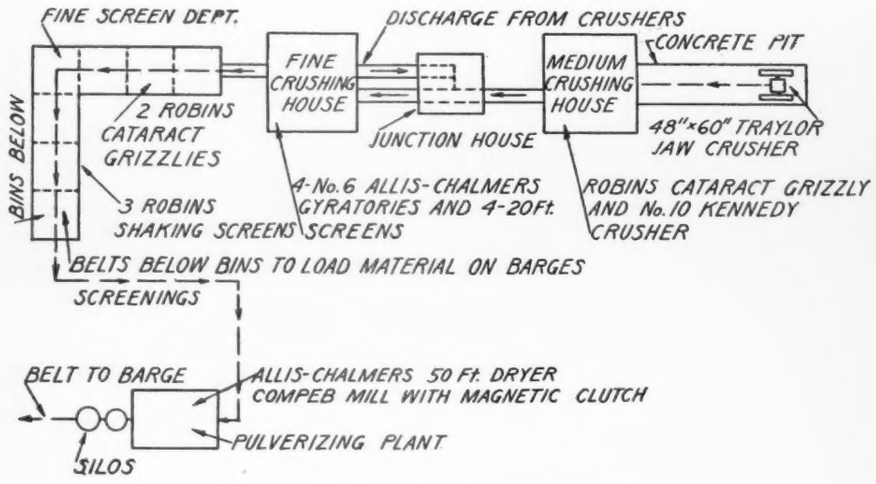
set of four revolving screens on the upper floor of the fine crushing house. This contains four No. 6 Allis-Chalmers gyratories. The screens are also of Allis-Chalmers make and they are 20 ft. long and 60 in. in diameter. The screening surface is perforated manganese steel plate with 2⅞-in holes.

These crushers are set below the screens and the oversize of the screens will flow to them by gravity. The building is not only large enough, but the foundations are in place and everything is ready to install another set of four crushers or a large roll, as may be desired. Either method will give a large increase to the capacity of the plant.

The product of these crushers falls on a 36-in. belt, which takes it to the "junction house." This is a building standing between the fine crushing house and the building which houses the No. 10 gyratory. It contains only the head pulley and motor for the return conveyor and the chutes for carrying the material from the return conveyor to the main conveyor. The arrangement puts the fine crushers in a closed circuit with the screens so that only that part of the

product which has passed the screen openings is carried on to the fine screens and bins.

Everything goes from the lower part of the fine crushing house to the fine screening department, which is above the bins, and this



Layout of the plant, not drawn to scale

department is unique in the type and arrangement of machines that are used. The first machine is a pair of Robins Cataract grizzlies, which make a 1½-in. product. The oversize of these grizzlies goes to a bin, the undersize to a 36-in. conveyor, which takes it to a second pair of Cataract grizzlies with 1-in. openings. The undersize is then conveyed to two Robins shaking screens which are covered with ¾-in. mesh wire cloth and the undersize goes to two Robins shaker screens with ½-mesh wire cloth. A third and last pair of Robins shaking screens, with ¼-in. mesh wire cloth, separates the screenings. These fall on a 24-in. conveyor belt, and by a chute and two more conveyor belts, in series, they are taken to the pulverizing plant. When more screenings are produced than the pulverizing plant can handle the surplus is spouted to another 24-in. belt which carries them back through the plant to a storage pile at the end of the building. The trestle for the belt that will convey these screenings to storage may be seen in the picture taken from the river front in one of the pictures.

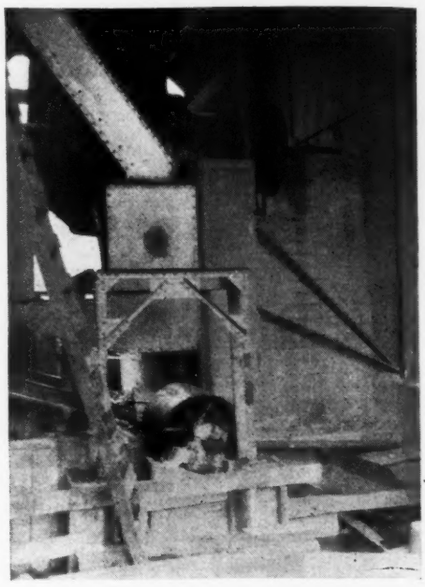
The design of this plant is practically of the single-level straight line type. There is an elevation from the primary jaw crusher, which is below the quarry floor, and another from the ground level to the fine screening department, which is above the bins. Otherwise the only elevation given by the belts is that of the headroom for each machine or crushing and screening unit. Such a plant, when conditions were reversed, and the bins were below the quarry level, might be built as a single level plant; that is, with all the units on the same floor level, even though they were not housed in the same building.

This is not usual in crushing plants. In fact, it was almost an impossible design when all the machines were driven by belts and had to be kept quite near the source of power. With electric drives the machines can be placed anywhere, and the conveyors which pass the product from one unit to another can do the elevating that is required with so slight an increase of power that it is hardly to be noticed.

Some advantages of this straight-line, single level layout are that of simpler construction, keeping the machines close to the ground and reducing the effect of vibration on the buildings. If the plant is not of fireproof construction, there is less danger of the entire plant burning if a fire starts. And the advantage of using belts in place of elevators is obvious enough to anyone who has had experience with both. However, in this instance the most obvious advantage is that of conveying the product to the point of delivery at the same time that it is passing through the various stages of crushing.

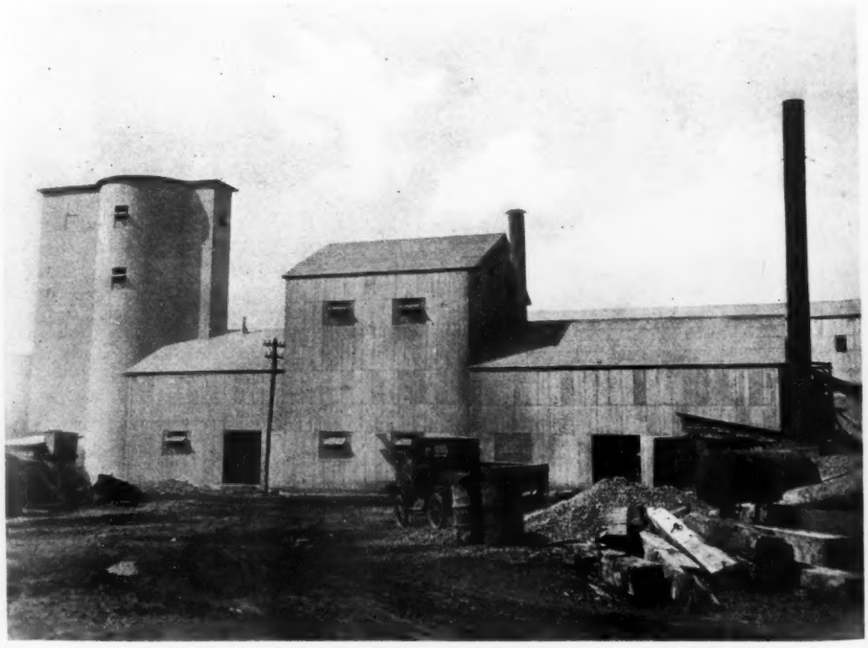
The buildings which house the various units are all of reinforced concrete put up with sliding forms. In one day 13-ft. height was obtained on a wall by this method.

The conveyors were all furnished by the Robins Conveying Belt Co. All are carried on steel frames of the bridge truss type supported on steel trestles. They are enclosed with corrugated galvanized steel plates. The troughing rolls have five to each set.



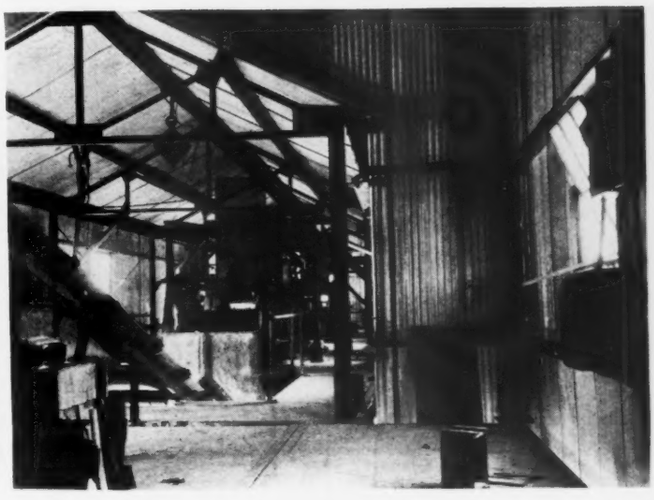
Under the No. 10 gyratory. Note steel construction of chutes

All the motors in the plant are of Allis-Chalmers design and make. Reduction of

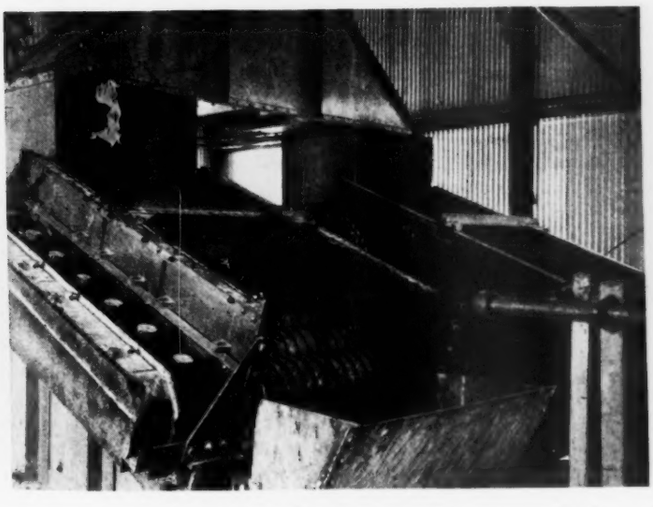


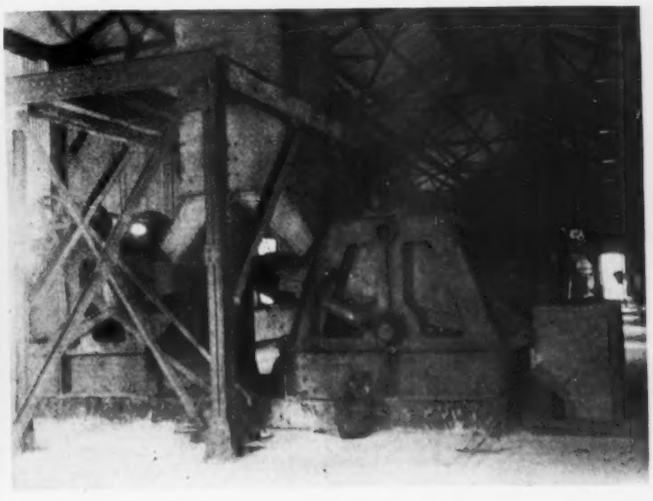
The pulverizing plant in which screenings are ground for filler and agricultural purposes

Left—The quarry as seen from the fine screening department. Right—The house from which the haulage system is controlled



Left—One of the cars of the centrally controlled haulage system. Right—Interior of fine screening department





Left—Grizzly used as a fine screen. Right—Shaking screens in the fine screening department

speed is by Palmer-Bee speed reducers and chain and sprocket drives are generally employed. In fact, the only belt drives are the short belts, which are used on the Robbins shaking screens.

The pulverizing plant to which the screenings of the new plant will be sent is the finest plant of the kind which the writer has seen. It has been running about six months, the feed coming from accumulated screenings from the old plant, which are hauled in by truck. The screenings go first to an Allis-Chalmers dryer 50 ft. long and then through a cyclone, which takes out the dust. A feeder then sends them to an Allis-Chalmers Compeb mill, which is driven by a 450 h.p. Allis-Chalmers synchronous motor through a magnetic clutch. The success of this magnetic clutch has been such that it will be tried out on a crusher drive. The product is elevated to two concrete silos below, which is a Bates valve-bag packer, by which it is put in paper bags for shipment. These bags are carried on a belt conveyor to covered barges into which they are packed by hand. One of these barges is seen lying in front of the pulverizing plant in the water-front picture.

All the machinery in the pulverizing plant, including the dryer, has been painted with aluminum paint, which gives the plant an unusually spick-and-span appearance. There is no dust in the grinding department, but necessarily some dust in the silos and the packing department. Arrangements have been made to install a dust collecting system so that the whole operation from the start to the finish will be dustless. The product of this plant is principally used as asphalt filler, although some of it is used as agricultural limestone.

The entire operation is in charge of Thomas J. Kelleher, who has also superintended the construction of the plant from the first.

The New York Trap Corp. has its main office at 101 Park avenue, New York. It is one of the largest producers of crushed stone in the New York district and one of the oldest organizations in the crushed stone business. W. M. Wandell is general manager and R. T. Gent is general superintendent of quarries.

Kostenbader Quarries Acquired by Reading, Pennsylvania

THE Reading Penn., council has authorized its city solicitor to make settlement with A. F. Kostenbader, owner, and the Reading Sand and Stone Co., lessee, for the quarry property on the western slope of Mt. Penn for $48,000. The quarry formerly operated by the Reading Sand and Stone Co. was acquired by the city through condemnation proceedings and viewers awarded the owners $45,000. This amount was not satisfactory. According to the *Allentown, Penn., Call* the new terms are expected to effect a final settlement of the case.

Who Says Construction Business Is Anything But Good?

Construction During May Had Already Reached a Higher Point Than at the Height of the 1924 Season

ALL existing records for volume of construction work under way in the United States during a single month were shattered in May, according to statistics compiled by the Associated General Contractors of America. The May volume was 26% greater than that of April, reflecting the great volume of contracts awarded during the two preceding months. The amount of construction activity in the first five months of this year is being taken as an indication that 1925 will set a new twelve-month record.

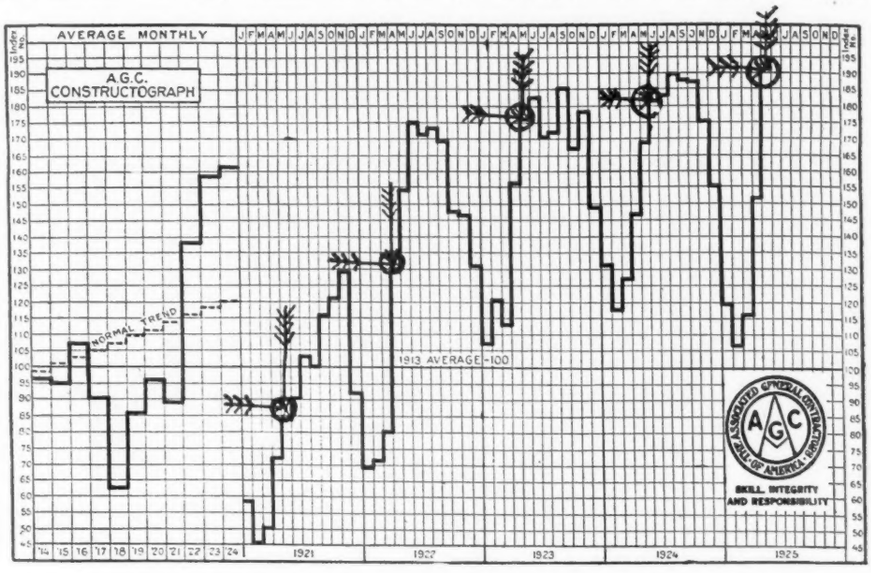


Chart showing building record since 1921, with May points specially marked

The cost of construction in the principal centers of the United States remained stationary during May, being exactly double that of 1913. The fact that costs have not increased as a result of the heavy volume of contracts awarded in March is being viewed as a marked assurance of the present stability of the construction industry.

The volume of building contracts during April was the greatest for any month in any year on record, exceeding the previous high mark set in the preceding month, by 11%. Contracts awarded during the first four months of 1925 exceeded the volume of those awarded during the corresponding period of 1924 by 8%.

Building permits issued during April showed an increase of 20% over March. The combined volume of building permits issued during the first four months of 1925 is 4% less than the corresponding 1924 figure.

The average of wages in the building trades as paid in the principal construction centers of the United States showed no change from the April mark during May. There has been no change in this average since January. The average of prices paid by contractors for construction materials declined one point during May, lower prices for lumber and brick in several localities being chiefly responsible.

Contracts awarded for concrete surface pavement during April totalled 4,900,000 sq. yd. for streets and alleys and 12,500,000 sq. yd. for roads. The combination of these totals, 17,400,000 sq. yd., is larger than the corresponding figure for any month on record, exceeding the previous high mark, set in April, 1922, by 38%. The combined yardage awarded during the first four months of 1925 exceeds the corresponding figure for 1924 by 32%.

Course in Concrete Mixing at Birmingham Well Attended

THE school of instruction, consisting of a two weeks course, in design and control of concrete mixtures offered to engineers of Birmingham, Ala., and vicinity through the courtesy of the Portland Cement Association, was attended by 170 engineers, according to a statement by J. R. Fairman, district engineer for the association. The course was given in 10 sessions of three hours each in which lectures, demonstrations and general instruction were offered.

Full Text of the U. S. Supreme Court Decision in Cement Manufactures' Protective Association Case

A Trade Association Decision of Far-Reaching Significance to the Rock Products Industry

Cement Manufacturers Protective Association, The Atlas Portland Cement Company, The Allentown Portland Cement Company, et al., Appellants, *vs.* The United States of America } Appeal from the District Court of the United States for the Southern District of New York.

[June 1, 1925]

Mr. Justice Stone delivered the opinion of the Court.

This is an appeal from a final decree of the District Court for the Southern District of New York granting a perpetual injunction in a proceeding brought by the United States under Section 4, Chapter 647 of the Act of July 2, 1920, 26 Stat. 209, commonly known as the Sherman Act. Defendants are the Cement Manufacturers Protective Association, an unincorporated association, four individuals, the officers of the Association and nineteen corporations, members of the Association, engaged in manufacturing and shipping Portland cement in interstate commerce, in Pennsylvania, New Jersey, New York, Maryland and Virginia. The petition, which was filed on the 30th day of June, 1921, alleges restraint of interstate commerce in violation of Section 1 of the Act. The complaint prays that the Cement Manufacturers Protective Association be adjudged a violation of Section 1 and enjoined accordingly. After final hearing, the District Court entered its decree enjoining the continuance of the Cement Manufacturers Protective Association and enjoined it and the several defendants from engaging in the activities of which the Government complains and of which a summary account will presently be given.

The Association was organized in January, 1916. Its purposes, as described by the Constitution, were the "collection and dissemination of such accurate information as may serve to protect each manufacturer against misrepresentation, deception and imposition, and enable him to conduct his business exactly as he pleases in every respect, and particularly free from misdirection by false or insufficient information concerning the following matters, to wit:

(a) Information concerning credits;

(b) Information concerning contracts which have been made for the delivery of cement sufficiently complete to enable the manufacturer to protect himself against spurious contracts and like transactions induced by misrepresentations;

(c) Information concerning freight rates on cement;

(d) Statistical information as to production; stocks of cement and clinker on hand, and shipments."

The Constitution also provides that "membership in the Association shall be recognized as implying that the member is absolutely free to conduct his business exactly as he pleases in every respect and particular."

Cement is a thoroughly standardized product. It is manufactured from limestone and shale which are crushed to extreme fineness, then subjected to high temperatures which process produces a fused mass, which when cooled is known as clinker. The clinker is then ground into the finished product which is then ready for transportation and use. Clinker is not subject to deterioration, but the ground clinker or cement deteriorates rapidly on exposure to moisture and cannot be kept in storage except for a limited period of time. The defendant corporations are manufacturers of this product, which is shipped in interstate commerce principally within the areas of the several states in which the several defendants are located, and they are competitors in the business of shipping the product in interstate commerce. From 60% to 65% of the total product of the several corporate defendants is sold to the general trade for immediate use. Of this 60% to 65% approximately two-thirds is sold to dealers who are allowed a differential from the sales price to the retail trade.

The activities of defendant, on which the Government bases its case for an injunction, may summarily be stated as follows: The Government charges that the defendants, through the activities of the Association, control prices and production of cement within the territorial area served by the several defendants in the following manner:

(1) By the use of "specific job contracts" for future delivery of cement, accompanied by a system of reports and trade espionage having as its objective the restriction of deliveries of cement under those contracts.

(2) By compiling and distributing, among the members, freight rate books which give the rate of freight from arbitrary basing points to numerous points of delivery within the territorial area served by the several defendants;

(3) By exchange of information concerning credits;

(4) By activities of the Association at its meetings.

The Government asserts that uniformity of prices and limitation of production are necessary results of these activities of the defendants. It does not, however, charge any agreement or understanding between the defendants placing limitations on either prices or production. The evidence does not establish that prices were excessive or unreasonable and the District Court found "as compared with the rise of prices of other basic commodities, it is possible to say that the quotations of cement advanced less than others." The Court also found that competition had not been destroyed by the Association and that upon many occasions the defendants were active in endeavoring to take business from companies associated with them. The court, however, held that the activities of the defendant in connection with specific job contracts tended to limit the amount of cement distributed to the trade under those contracts; that the exchange of information complained of generally tended to limit production; that the dissemination of this information, especially that contained in the freight rate book, tended to produce uniformity in price, and that there was accordingly a restraint of commerce within the principles laid down in *American Column & Lumber Co.* v. *United States*, 257 U. S. 393; *United States* v. *American Linseed Oil Company*, 262 U. S. 371.

It is conceded, and the court below found, that before the organization of the present association there was substantial uniformity of trade practices in the cement trade, so far as is pertinent to the present discussion, in the following respects:

(1) The sale of cement by specific job contracts for future delivery;

(2) The selling of cement, f.o.b. delivery;

(3) Using freight basing points in the quotation of prices;

(4) Including in all quotations for sale of cement, a freight rate from a basing point to the place of delivery;

(5) Charging purchasers of cement for bags in which the product is shipped and allowing credit for bags returned to the manufacturers in good condition.

Since there is no exchange of information among the defendants with respect to contracts for the sale of cement for immediate delivery, which constitutes more than 60% of the business, the Government's contention before this Court centered upon the use of the specific job contract by defendants and their activities in connection with such contracts, since without the use of the specific job contract the other activities complained of could have no substantial bearing on restraint of competition with respect either to prices or production. It will therefore be necessary to consider more at length the activities of the defendants in connection with specific job contracts and incidentally their other activities as related to sales of cement under specific job contracts and the information exchanged with respect to such contracts.

Specific Job Contracts

The specific job contract and the practices of the trade with respect to making deliveries in performance of those contracts were customary in the trade long before any of the collective activities complained of in this case. We do not understand the Government to contend that the use of specific job contracts by defendants or that their use generally by the trade is the result of any agreement or understanding or in itself constitutes any violation of the Sherman Law. It is contended that the violation arises rather from the co-operation among the several defendants in acquiring and distributing information with reference to specific job contracts and the effect of the dissemination of that information on the trade, to which reference will now be made.

The specific job contract is a form of contract in common use by manufacturers of cement whereby cement is sold for future delivery for use in a specific piece of construction which is described in the contract. As was stated in the opinion of the court below, they are contracts "whereby a manufacturer is to deliver in the future, cement to be used in a specific piece of work, such as a particular building or road, and the obligation is that the manufacturer shall furnish and the contractor shall take only such cement as is required for or used for the specific purpose." These contracts have, by universal practice, been treated by cement manufacturers as, in effect, free options customarily made and acted upon on the understanding that the purchaser is to pay nothing until after the delivery of the cement to him; that he is not obligated in any event to take the cement contracted for unless he chooses to; that he is not held to the price named in the contract in the event of a decline in the market price; whereas the manufacturer may be held to the contract price if the market advances and may be held for the delivery of the full amount of cement required for the completion of the particular piece of construction described in the contract. The practical effect and operation of the specific job contract therefore is to enable contractors who are bidding upon construction work to secure a call or option for the cement required for the completion of that particular job at a price which may not be increased, but may be reduced if the market declines. It enables contractors to bid for future construction work with the assurance that the requisite cement will be available at a definitely ascertained maximum price.

In view of the opinion features of the contract referred to, the contractor is involved in no business risk if he enter into several specific job contracts with several manufacturers for the delivery of cement for a single specific job. The manufacturer, however, is under no moral or legal obligation to supply cement except such as is required for the specific job. If, therefore, the contractor takes advantage of his position and of the peculiar form of the specific job contract, as modified by the custom of the trade, to secure deliveries from each of several manufacturers of the full amount of cement required for the particular job, he in effect secures the future delivery of cement not required for the particular job, which he is not entitled to receive, which the manufacturer is under no legal or moral obligation to deliver and which presumably he would not deliver if he had information that it was not to be used in accordance with his contract. The activities of the defendants complained of are directed toward securing this information and communicating it to members and thus placing them in a position to prevent contractors from securing future deliveries of cement which they are not entitled to receive under their specific job contracts, and which experience shows they endeavor to procure especially in a rising market.

Members are required to make to the Secretary of the Association prompt reports of all specific job contracts, describing in detail the contract and giving the name and address of the purchaser; the amount of cement required, the price and delivery point; also the date of expiration of the contract. They are also required to make detailed reports of all changes in the contract, including increases in the amount of cement to be delivered and cancellations. The Association also employs "checkers" whose business it is, by actual inspection and inquiry, to ascertain, so far as possible, the amount of cement required for specific jobs referred to in specific job contracts, and whether cement shipped under specific job contracts is actually used or required for use under such contracts. Without entering into any detailed discussion of this phase of the activity of defendants, we accept fully the Government's contention that the defendants regularly take all practicable steps to ascertain whether cement contracted for under the specific job type of contract was actually being used for the job described in the contract, and that the fullest information with respect to such contracts and the use of cement shipped under said contracts is reported to the members of the Association through the mediation of the Secretary.

The Government does not contend that the activities of the Association with respect to specific job contracts diminished the number of such contracts, or that they diminished in any way the obligations of members of the Association upon such contracts. There is, however, abundant evidence to show that there were actual cancellations of deliveries on the ground that contractors were not entitled, under the terms of their contracts, to receive such deliveries. In 1920, of 1392 contracts investigated and found to be "padded" to the extent of more than 3,500,000 bbl. of cement, 978 were partially cancelled to the extent of 2,014,653 bbl.

The Association Freight Rate Book

The custom in the cement trade of selling cement at a delivered price which includes the mill price; the price of bags and freight charges, was an established trade practice before the organization of the defendant association. As required by the by-laws of the defendant association, it has distributed to its members freight rate books, listing freight rates from established basing points to practically every city and town in the northeast section of the United States. The freight rates contained in the freight rate book are compiled from the official tariffs and translated from the rate per ton of the official tariffs into the rate per barrel of 380 lb., the unit for the sale of cement. Similar lists of freight rates embracing substantially the same subject matter were prepared and used by individual manufacturers before the organization of the defendant association. The Association freight rate book took the place of previous separate publications by individual manufacturers, with a consequent saving of money and increase of accuracy and a more thorough and continuous checking of rates. The basing points from which freight rates were calculated were not selected by the Association, but were the same as those appearing in prior books published by individuals before the publication of the Association freight rate book. The basing points are points of actual shipment from which the larger proportion of the cement in a given locality in which cement is manufactured is actually shipped. The rates published are the actual rates omitting fractions of cents between the basing points and actual points of delivery.

Manufacturers customarily and for the purpose of the convenient conduct of their business maintain a uniform base or factory price, so far as the customers of the individual manufacturer are concerned. That is to say the business is conducted on a "one-price" basis. In order, however, to determine the delivered price, there must be added to the factory price of a given manu-

facturer the cost of transportation to the point of delivery. Prompt quotations of a delivered price therefore involves the ability to carry out promptly the mechanical process of adding to the mill price, the cost of transportation to the point of delivery. Lists of freight rates, in convenient and readily available form, are therefore necessary adjuncts to the quotation of delivery prices for cement.

The use of basing points for the purpose of computing freight rates appears not to have been the result of any collective activity on the part of defendants or cement manufacturers generally, nor were they arbitrarily selected. Their use is rather the natural result of the development of the business within certain defined geographical areas. When a manufacturer establishes his factory at a given point of production and sells his product in a territory which is contiguous freightwise to his factory, other mills established in the vicinity and serving the same territory, in order to compete in that territory, must either secure a like freight rate or they must sell at a mill price which will permit them to deliver cement at a price which will enable them to compete with the mill or mills located at the basing point which is the principal point of production in the territory which is contiguous in point of freight rate to the basing point. If such competing mills secure the same freight rate through the adoption of a blanket freight rate by the Interstate Commerce Commission, as was done in the Lehigh Valley, the rate from the basing point would in every case be identical with the freight rate for the competing mills. If there were no blanket freight rate, the competing mills must still use the rate from a given basing point in order to compete with the mills located in the vicinity of that chief point of production. In either case, the freight rate from the basing point is an essential element in making a delivered price, since selling by any particular manufacturer at the lowest of the delivered prices computed from several basing points is a necessary procedure in competing in the sale of cement. The freight rate book, therefore, not only enables the manufacturer to calculate a delivered price on the basis of his own mill price, which he determines, to points in the territory nearest in point of freight rate to his own mill, but it enables him also to determine at once the freight differential which he must offset in his mill price in order to compete with other manufacturers serving any other given territory.

Exchange of Information Concerning Credits

Members of the Association render monthly reports of all accounts of customers two months or more overdue, giving the name and address of the delinquent debtor; the amount of the overdue account in ledger balance; accounts in hands of attorneys for collection and any explanation, as, for example, when the account was treated by the debtors as offset of a balance due for bags, or was otherwise disputed. There are also reports showing the general total of delinquent accounts in comparison with those for the last twelve months and reports of payments of accounts placed in the hands of attorneys. There was a form, seldom used, for answering inquiries as to whether a particular name had appeared in the monthly report, and if so, where. There were never any comments concerning names appearing on the list of delinquent debtors. The Government neither charged nor proved that there was any agreement with respect to the use of this information or with respect to the persons to whom or conditions under which credit should be extended. The evidence falls far short of establishing any understanding on the basis of which credit was to be extended to customers or that any co-operation resulted from the distribution of this information, or that there were any consequences from it other than such as would naturally ensue from the exercise of the individual judgment of manufacturers in determining, on the basis of available information, whether to extend credit or to require cash or security from any given customer.

Statistical Information

The statistical activities of the Association, other than those relating to specific job contracts which have already been referred to, dealt with information as to existing supplies of cement and the so-called bag report which gave information concerning returned bags which are the usual containers in which cement is shipped and delivered.

Each member of the Association, in addition to the reports on specific job contracts already referred to, sends to the Association a monthly statement of its production of clinker and ground cement, shipments and stock on hand for the past month and for the corresponding periods of the previous year. These were compiled and distributed to members without any change or comment. In addition semi-monthly statements of shipments were also received and likewise distributed. Each member of the Association was thus given full information as to the available supply of cement and by whom it was held.

By universal practice, the price of bags in which cement is shipped is included and becomes a part of the mill base price. This is usually at the rate of 10 cents per bag. The bag reports were made quarterly and contained two items; the total number of bags returned by each member during the preceding quarter and the percentage thereof found unfit for use. The reports show that the loss varied from about ¾ to 1% by one manufacturer to about 4½% by another and the diversity continued throughout the period covered by the reports.

In 1918 a questionnaire was sent out enquiring as to the practice of each company to determine whether better results were obtained by cleaning before or after counting, showing that some counted before cleaning and some after cleaning, and some both before and after. No information was reported concerning the charge and allowance or deposit for bags returned, or concerning the number received from any particular customer, or the portion found unfit for use.

Meetings

The Constitution and By-laws of the Association provided for monthly meetings. A full and accurate stenographic report of all discussions at meeting was kept and made available to the Government and as is stated in the Government's brief "the Association's counsel was present at every meeting to steer the discussions away from illegal subjects and to have them confine the matters strictly within the purview of the By-laws and the Constitution of the Association." During the only period of rising markets since the relinquishment of war control, the spring and summer of 1920, no meetings were held during July and August. The later minutes contained complaints at smallness of attendance and the number of companies represented at meetings varied from 11 to 17, with an average attendance of about two-thirds of the total membership of 19 corporations. There was no discussion at these meetings of current prices; no comment on conditions or as to prospect of market, production or prices. Excerpts from the minutes are set out by the Government's brief at great length, indicating that from time to time individual representatives of the companies expressed themselves on subjects of minor importance; such as return of bags, and bag reports; discounts; the use of trade acceptances where customers desired more than the customary 30 days' discount. But with reference to these suggestions and discussions, either no action was taken, or action was taken adverse to the suggestions made. There is no evidence that any agreement was reached affecting any of the matters discussed; nor does the Government point specifically to any uniformity of trade practice or custom followed, which is urged as even inferentially the result of activities at meetings.

Legal Consequence of Defendants' Activities

From these various activities of the defendants, the Government deduces a purpose to control the price of cement which it is charged was to be accomplished by the control of the supply of cement on the market and by intimate association of the defendants in the exchange of information and a ready means of quoting a delivered price at any point. Cement was to be kept from the market by the use of the specific job contract accompanied by the systematic gathering and reporting of information with reference to the specific jobs and the amount of cement required for their completion.

The two essential elements in the conspiracy to restrain commerce charged therefore are (a) the gathering and reporting of information which would enable individual members of the Association to avoid making deliveries of cement on specific job contracts which by the terms of the contracts they are not bound to deliver, and (b) the gathering of information as to production, price of cement sold on specific job contracts and transportation costs not differing essentially from similar information, disseminated by the Maple Flooring Association, which is the subject of the opinion in *United States* v. *Maple Flooring Association*, decided today.

That a combination existed for the purpose of gathering and distributing these two classes of information is not denied. That a consequence of the gathering and dissemination of information with respect to the specific job contracts was to afford to manufacturers of cement, opportunity and grounds for refusing deliveries of cement which the contractors were not entitled to call for, an opportunity of which manufacturers were prompt to avail themselves, is also not open to dispute. We do not see, however, in the activity of the defendants with respect to specific job contracts any basis for the contention that they constitute an unlawful restraint of commerce. The Government does not rely on any agreement or understanding among members of the Association that members would either make use of the specific job contract, or that they would refuse to deliver "excess" cement under specific job contracts. Members were left free to use this type of contract and to make such deliveries or not as they chose, and the evidence already referred to shows that in 1920 padded specific job contracts were cut down something less than two-thirds of the total amount of the padding as a result of the system of gathering and reporting this information. It may be assumed, however, if manufacturers take the precaution to draw their sales contracts in such form that they are not to be required to deliver cement not needed for the specific jobs described in these contracts, that they would, to a considerable extent, decline to make deliveries, upon receiving information showing that the deliveries claimed were not called for by the contracts. Unless the provisions in the contract are waived by the manufacturer, demand for and receipt of such deliveries by the contractor would be a fraud on the manufacturer and in our view the gathering and dissemination of information which will enable sellers to prevent the perpetration of fraud upon them, which information they are free to act upon or not as they choose, cannot be held to be an unlawful restraint upon commerce, even though in the ordinary course of business most sellers would act on the information and refuse to make deliveries for which they were not legally bound.

In *Swift & Co.* v. *United States*, 196 U. S. 375, 395, this Court approved a decree which provided that defendants should not be restrained "from establishing and maintaining rules for the giving of credit to dealers where such rules in good faith are calculated solely to protect the defendants against dishonest or irresponsible dealers." Distribution of information as to credit and responsibility of buyers undoubtedly prevents fraud and cuts down to some degree commercial transactions which would otherwise be induced by fraud. But for reasons stated more at length in our opinion in *United States* v. *Maple Flooring Association, supra*, we cannot regard the procuring and dissemination of information which tends to prevent the procuring of fraudulent contracts or to prevent the fraudulent securing of deliveries of merchandise on the pretense that the seller is bound to deliver it by his contract, as an unlawful restraint of trade even though such information be gathered and disseminated by those who are engaged in the trade or business principally concerned.

Exchange of Prices on Closed Jobs

Nor for the reasons stated, can we regard the gathering and reporting of information, through the co-operation of the defendants in this case, with reference to production, price of cement in actual closed specific job contracts and of transportation costs from chief points of production in the cement trade, as an unlawful restraint of commerce; even though it be assumed that the result of the gathering and reporting of such information tends to bring about uniformity in price.

Agreements or understanding among competitors for the maintenance of uniform prices are of course unlawful and may be enjoined, but the Government does not rely on any agreement or understanding for price maintenance. It relies rather upon the necessary leveling effect upon prices of knowledge disseminated among sellers as to some of the important factors which enter into price. It is conceded that there is a substantial uniformity of price of cement. Variations of price by one manufacturer are usually promptly followed by like variation throughout the trade. As already indicated, the larger proportion of the product of the defendants is distributed through dealers and prices to dealers are not reported to or through the Association. It is contended by the Government that the report of prices on specific job contracts in effect informs the members of the Association of prices to dealers, since the differential allowed to dealers is well known in the trade. However this may be, the fact is that any change in quotation of price to dealers promptly becomes well-known in the trade through reports of salesmen, agents and dealers of various manufacturers. It appears to be undisputed that there were frequent changes in price and uniformity has resulted not from maintaining the price at fixed levels, but in the prompt meeting of changes in prices by competing sellers.

Uniformity of Price

It is urged by the defendants that such uniformity of price as existed in the trade was due to competition. They offered much evidence tending to show complete independence of judgment and of action of defendants by large expenditures in competitive sales efforts and by variations in the volume of their production and shipment, earnings and profits. A great volume of testimony was also given by distinguished economists in support of the thesis that in the case of a standardized product sold wholesale to fully informed professional buyers as were the dealers in cement, uniformity of price will inevitably result from active, free and unrestrained competition, and the Government in its brief concedes that "undoubtedly the price of cement would approach uniformity in a normal market in the absence of all combinations between the manufacturers."

We realize also that uniformity of price may be the result of agreement or understanding and that an artificial price level not related to the supply and demand of a given commodity may be evidence from which such agreement or understanding or some concerted action of sellers operating to restrain commerce may be inferred. But here the Government does not rely upon agreement or understanding and this record wholly fails to establish, either directly or by inference, any concerted action other than that involved in the gathering and dissemination of pertinent information with respect to the sale and distribution of cement to which we have referred, and it fails to show any effect on price and production except such as would naturally flow from the dissemination of that information in the trade and its natural influence on individual action.

For reasons stated in *United States* v. *Maple Flooring Association, supra*, such activities are not in themselves unlawful restraints upon commerce and are not prohibited by the Sherman Act.

The judgment of the District Court is reversed.

Mr. Chief Justice Taft and Mr. Justice Sanford dissent from the opinions of the majority of the Court in these two cases on the ground that in their judgment the evidence in each case brings it substantially within the rules stated in the *American Column Co.* and *American Linseed Oil Co. Cases*, the authority of which, as they understand, is not questioned in the opinion of the majority of the Court.

The separate opinion of Mr. Justice McReynolds:

These causes disclose carefully developed plans to cut down normal competition in interstate trade and commerce. Long impelled by this purpose, appellants have adopted

various expedients through which they evidently hoped to defeat the policy of the law without subjecting themselves to punishment.

They are parties to definite and unusual combinations and agreements, whereby each is obligated to reveal to confederates the intimate details of his business and is restricted in his freedom of action. It seems to me that ordinary knowledge of human nature and of the impelling force of greed ought to permit no serious doubt concerning the ultimate outcome of the arrangements. We may confidently expect the destruction of that kind of competition long relied upon by the public for establishment of fair prices, and to preserve which the Anti-Trust Act was passed.

United States v. *American Linseed Oil Co., 262* U. S. *371*, states the doctrine which I think should be rigorously applied. Pious protestations and smug preambles but intensify distrust when men are found busy with schemes to enrich themselves through circumventions. And the Government ought not to be required supinely to await the final destruction of competitive conditions before demanding relief through the courts. The statute supplies means for prevention. Artful gestures should not hinder their application.

I think the courts below reached right conclusions and their decrees should be affirmed.

Portland Cement Association Cited as Model "Business Research" Organization

Abstract of a Speech Delivered at New York, May 26, Before the Trade Association Executives by Henry Bruere, Vice-President of the Metropolitan Life Insurance Company

AN impressive fact that characterizes modern industrial invention is that it is the product of scientific research largely conducted by the related industries themselves.

Our federal government, largely because of the pioneer work of the Bureau of Standards, is converting abstract scientific knowledge into applied industrial science with the co-operation of industry and in its behalf.

Commercial Research

There is an impressive amount of technical industrial research. Less is being done in the important field of commercial research. Here again the federal government is taking a leading part, under the guidance of Secretary Hoover in the Department of Commerce. The simplification and standardization work accomplished by the department in co-operation with trade associations is a first-class contribution to sound business economics.

There are, however, great undiscovered worlds of knowledge in the domain of management. It is not a serious strain on truth to say that there is more common knowledge regarding astronomical facts that there is regarding the methods and principles of business management.

Knowledge of the science of business to continue the comparison with astronomy, is still in the astrological stage. We know that the velocity of light is 186,000 miles a second, an eight minutes' journey from here to the sun, and we know or we are authoritatively told that for the same ray of light to reach the nearest star would take four and one-half years. But with respect to the every day processes of business management most of us are unaware and we can only learn by costly experiment. We have not formulated the knowledge that has been accumulated generation after generation and dies with those who possess it. We have not taken it out of our heads.

The successful business man regards himself as an elastic, versatile creature, able to meet all the varying conditions that confront his business, but if you ask him how he does it, he will answer merely that he exercises good judgment or confront you with platitudes. As a matter of fact he is proceeding along rather clearly defined lines, so much so that "knowing the business" is a first requirement of any business man's formula for success.

Trade Co-operation To Public Advantage

It is a recent conception that business may co-operate to public advantage. The Sherman law rests on the age long suspicion of combinations since they were historically the means of strangling the consumer.

One of the most significant marks of commercial progress in recent times is the development of the conception of co-operation among members of a trade for the good of the community. In other words, we are beginning to see that our national trade and industrial equipment is a resource for the common good and that that good can best be served by accumulating knowledge regarding methods of performing the service to which trade and industry are dedicated. The trade association is performing an admirable function in this regard.

To mention only one of many that are functioning in the interest of the public as well as the trade, the Portland Cement Association work may be cited. The researches of this association, conducted at Lewis Institute in Chicago, are examples of the immediate practical utility of research in business.

It is not so important to consider prices and costs as it is to standardize methods and practices up to the level of the best ways of doing the business that have been developed. This is notably true in the field of human relations. The art of handling men is not an occult science or a gift of a few. It is a fairly definite science, the elements of which may be recorded from the actual experience of those who practice it successfully.

Business Is a Form of Public Service

As soon as we definitely convince ourselves that business is a form of public service and that the community is as much entitled to the results of experience and investigation in the field of business administration as it is in the realms of science, we shall have a new public regard for business activity and a notable strengthening in the business structure now too subject to the devastations of ignorance of progress in what is less an art than science.

Because business has been nearer our appetites than our sentiment, it has been slower to perceive the obligations that rested upon it to achieve for itself the degree of freedom to progress through exchange of methods and experience, which can only come when the public has been persuaded that co-operation between business men will result to the advantage of the public and employes, as well as to stockholders or individual owners.

Aetna Cement to Double Bay City Plant

ANNOUNCEMENT was made by the Aetna Portland Cement Co. May 8 that contracts would be let within the next 10 days for duplicating its plant at Bay City, Mich., the work to be completed early next spring and to cost in the neighborhood of $1,000,000. When completed the new plant will have a daily capacity of 2400 bbl. of cement. —*Saginaw (Mich.) News-Courier.*

Hints and Helps for Superintendents

Finger Chute Above a Crusher

By J. R. THOENEN

IN the accompanying illustration is shown a means of protecting the crusher head against unnecessary wear by the use of chute "fingers." The fingers are built of heavy timber and hung on a simple shaft

A finger chute above a crusher

hinge in the throat of the chute. The degree of opposition given to the flow of stone is regulated by the length of the upper arm. Each finger acts independently, which allows the holding back of an accumulation of fine stone while working a large block to the crusher. The upper ends of the fingers are fastened loosely to limit their radius of action.

Car for Shipping Silica Sand

THE car shown in the picture is one that has been designed by the Tavern Rock Sand Co., St. Louis, Mo., for shipping glass sand. It is a hopper bottom car on top of which is a tight wooden top which keeps the sand dry. Ventilating arrangements are provided and a door for filling.

This type of car might be adopted for the use of other rock products which are dried before shipment and which have to be kept dry. Phosphate rock, especially when this is in the form of sand is one such product. The use of hopper bottom cars permits easier unloading than the box cars in which these materials, including silica sand, are usually shipped. The picture was taken at the plant of the Tavern Rock Sand Co., near Millville, N. J.

Keeping Car Brakes Adjusted

By J. R. THOENEN

DOUBTLESS many quarry operators have had trouble keeping car brakes adjusted. Chas. Collins, superintendent for The Hutchinson Co., Oakland, Calif., solved this problem by placing a brake drum in the center of the axle as shown in the picture. The brake is operated by a foot lever at the end of the car through an adjustable rod. Old belting is used for lining. The braking action is very efficient and little adjustment or repairs are needed.

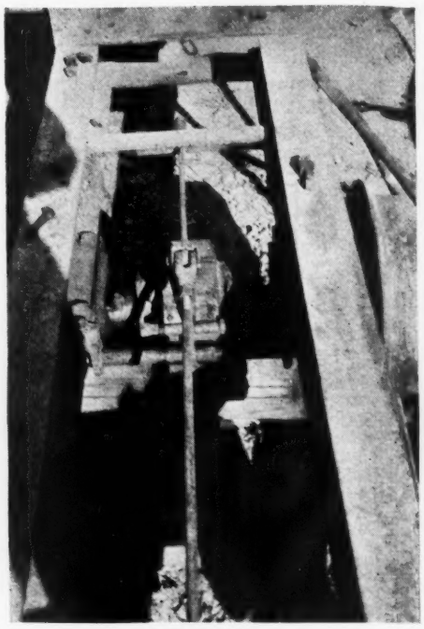
"Don'ts" for Rock Drills

DON'T expect your machine to do first-class work without giving it first-class care.

Use a proper grade of oil and plenty of it, and do not use cup grease in the lubricator, air spud, or feed screw.

Prevent water leakage from removing oil which should reach the moving parts. The chief reason for water leakage is improper placement of the water tube, or the use of defective rubber.

Don't shut off the air throttle completely before shutting off water.



Car brake with foot lever

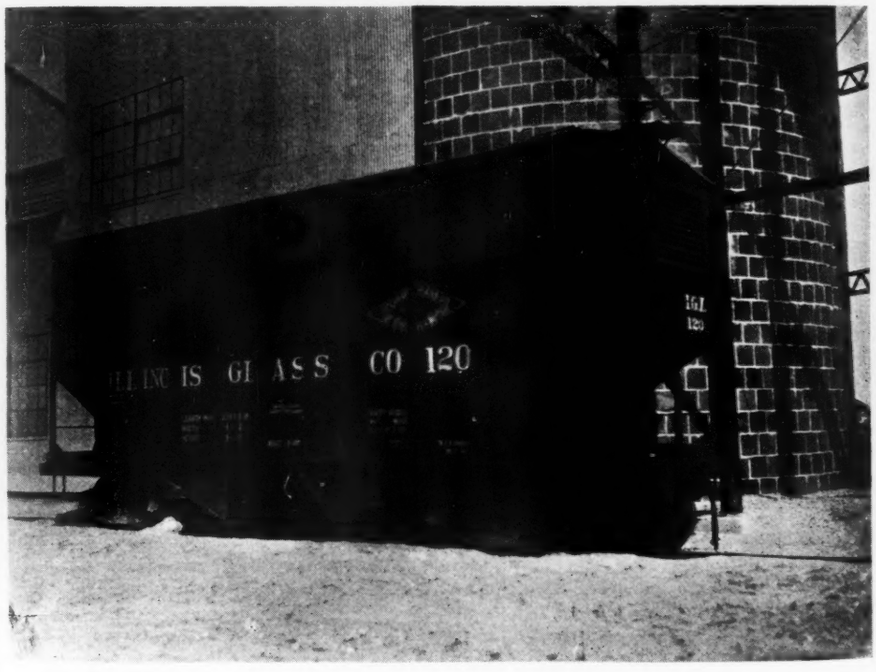
Don't use a leaky brass water valve.

Keep air-filter screen clean, and blow out hose thoroughly before making connection.

Keep side rods tight and even.

Run on half throttle when holding back on crank.

In striking your steel, be careful not to hit the machine.—*Compressed Air Magazine.*



Special type of car for silica sand and other products which must be kept dry

A Railway Sand-Dryer

THERE is a growing demand in the sand and gravel industry for artificially dried sand—for sanded plaster, for blast sand, for engine sand, etc. Various types of dryers are used—the ordinary, rotary, cylindrical dryer perhaps is the most common. Steam pipe-coil dryers are used in the silica sand industry quite extensively.

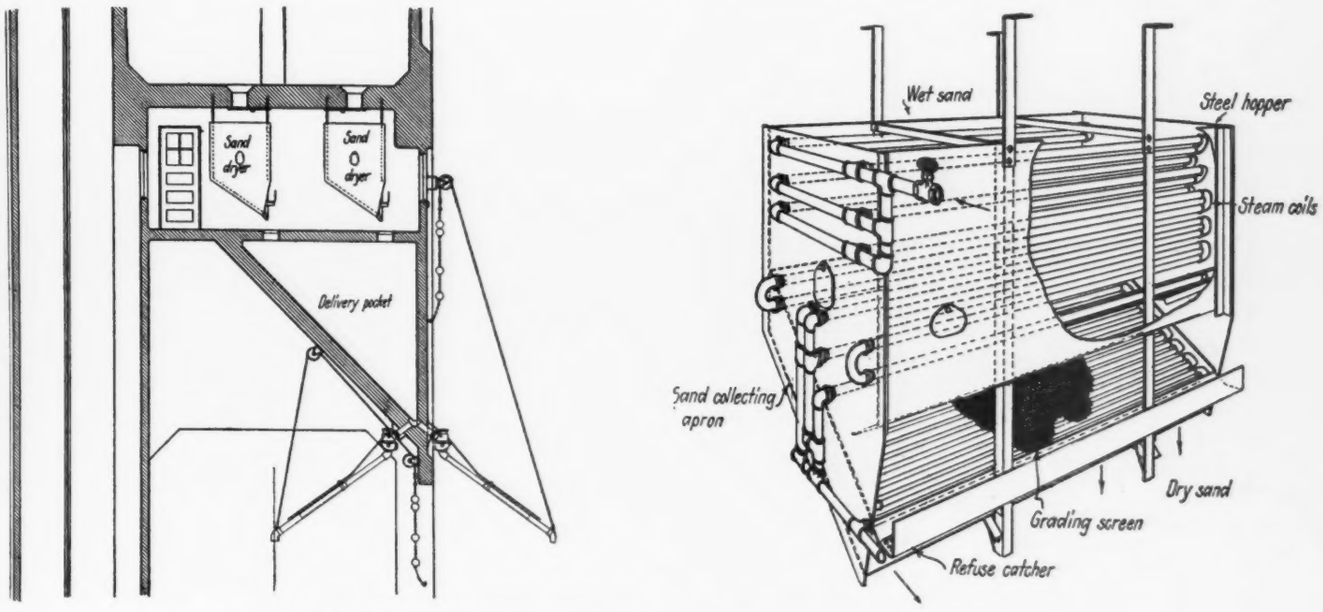
Most of the railway companies buy engine sand in bulk and do their own drying. These drying plants ordinarily are rather crude affairs. However, one of the newest railway sand drying plants—at Macon, Ga., for the Central Railroad of Georgia—looks as if it contains some ideas that may be used to advantage by producers of sand who are called upon to supply dry sand for special purposes in small quantities. The following description is from the *Railway Age:*

The moisture from this sand is removed by means of two sand dryers which are suspended immediately below the floor of this bin in a concrete walled compartment especially constructed for housing them. These dryers are a new development for such purposes. They comprise a rectangular steel box about 8 ft. 6 in. long and 4 ft. wide with a sloping bottom in which are carried steam coils. These coils are arranged in the form of a hopper with such a spacing of the pipes as will suffice to hold the sand until it is partially dried and at the same time to interpose such an obstruction to the passage of sand as will serve to break up any cakes that result from the heating. The position of this hopper in the box is also such that the outward radiation from the coils is utilized as well as the inward radiation, there being several inches of space between the coils and the sides of the box, where the sand also accumulates. Below these coils is a sloping screen carried on steam pipes several inches above the bottom of the steel box which is also sloping. Here all sand passing through the first steam coils is retained until it is thoroughly dry and all foreign matter is removed, which would otherwise pass down into the delivery chutes. The slope of this screen is such as to discharge the refuse into a trough at the side, where its removal from the plant requires occasional shoveling out. The bottom of the trough is also perforated to allow the escape of any sand which finds its way to this trough with the refuse.

The dry sand itself, after dropping through the screen, strikes the bottom of the steel box which is sloped sufficiently to discharge the sand into a sand delivery bin, from which it is delivered by gravity (to locomotives or cars).

Each sand dryer has a capacity of about 1 cu. yd. of sand per hour; the two dryers at Macon deliver 1½ tons of dried sand per hour. No trouble has been encountered in maintaining a gravity flow of damp sand through the floor of the bin into the sand dryers. In this case exhaust steam from the power plant is used for heating the coils.

The plant was designed by the Ogle Construction Co., Chicago, Ill., which specializes in railway coaling plants.



Left—Two sand dryers installed. Right—Construction of sand dryer

Simple Rules for Boiler Efficiency

W. F. Schaphorst, M. E.
45 Academy Street, Newark, N. J.

HERE is a handy rule for roughly determining boiler efficiency when the chimney gas temperature and the heat value of the fuel are both known:

"Multiply the temperature of the exit gases in degrees Fahr. by 625 and divide by the heat value in b.t.u. per lb. Then subtract from 100. The result is the approximate boiler efficiency in per cent."

The writer developed this rule in 1918 and has applied it ever since to boilers that have been tested and he finds that it is generally satisfactorily close.

For example, it can be applied with surprising accuracy even to the recent very high efficiency obtained in the New York City power plant, namely, 92.7%. In that case the chimney gas temperature was reduced to as low as 193 deg. Fahr. The heat value of the fuel was about 14,500 b.t.u. per lb. Applying the rule: multiplying 193 by 625 and then dividing by 14,500 we get 8.3. Subtracting 8.3 from 100 we get 91.7%. The actual overall efficiency as computed by the engineers in charge was 92.7%. In other words, this rule is only one per cent off even when applied to this unusual example.

For oil burning, the rule becomes:

"Multiply the temperature of the exit gases in degrees Fhr. by 5000 and divide by the heat value of the oil in b.t.u. per gallon. Then subtract from 100. The result is the approximate boiler efficiency in per cent."

The usual but much more complex procedure in determining boiler efficiency is to find the heat in the steam evaporated by the boiler and divide it by the heat given off by the fuel. In other words, boiler efficiency, like all other efficiencies, is equal to output divided by input. This chart, however, simplifies the whole affair. It is based on the logic that if you deduct the heat passing out of the chimney from the original heat contained in the fuel, you have the approximate amount of heat absorbed by the boiler. Then by dividing that amount by the original heat contained in the fuel we have the approximate boiler efficiency.

Unveiling of the "Sentinels of Safety" Trophy

ABOUT a score of interested people, including a representative of the United States Bureau of Mines and the editors of several technical and trade journals, attended the unveiling of the handsome bronze trophy, "Sentinels of Safety," at the studio of the sculptor, Begni del Piatta in New York City, May 20.

Motion pictures were taken of the event and all present had an opportunity to inspect the beautiful bronze statuette, replicas of which will be awarded to the coal mine, the metal mine and the quarry having the lowest accident record during the current year. The trophies are the gift of the *Explosives Engineer*, published by the Hercules Powder Co., Wilmington, Del., and N. S. Greensfelder, advertising manager of the company was host to the invited guests at the unveiling.

Rules Governing Award of Trophy

A synopsis of the rules governing the award of the trophy to the quarry industry are as follows:

1. The *Explosives Engineer* trophies will be awarded annually at the First Aid Meet conducted by the United States Bureau of Mines. They may be retained by the winners for one year.

2. Those eligible to compete for the trophy are companies operating a quarry or open-pit mine employing 25 or more men in the pit.

3. The winner will be the open-pit mine or quarry having the smallest loss of time from all classes of accidents in proportion to total number of hours of work performed. For computing the loss of time from any accident, the Standard Scale prepared by the International Association of Industrial Accident Boards and Commissions will be used.

Accidents ordinarily classified by the Bureau as due to explosives shall carry double penalty.

4. Data for determining the winners shall be obtained from a complete record of all lost-time accidents furnished by the operating company to the United States Bureau of Mines. This information may be submitted either on "special study" forms supplied by the Bureau or on other forms giving all the necessary data. Reports should show the number of calendar days (not work days) of the injured man's disability. Permanent injuries and deaths will be rated according to the scale of the International Association of Accident Boards and Commissions.

The accident reports shall cover the complete period of operations during the calendar year preceding the First Aid Meet at which the award is to be made. To be eligible, the mine or quarry covered by the reports shall have been in operation for at least 150 days during the year, and shall be a user of explosives. (For this contest a user of explosives shall be defined as a company consuming not less than 10,000 lb. of explosives during the period to which the award relates.)

5. In determining the winner, the Jury of Award shall have authority to choose between all mines or quarries whose accident rate shall be within one-tenth of a point of the lowest figure in each of the three above groups. Should the records of two or more contestants fall within this limit, the Jury's selection shall be governed by a comparison of natural conditions and the scope of the safety activities at the mine or quarry.

6. Companies operating more than one mine or quarry shall furnish reports for each, as the trophy will be awarded to the individual mine or quarry making the best record in each of the above three groups.

7. In addition to the trophy awarded to the company, each employee at the winning mine or quarry will receive a certificate of honor.

The trophy viewed in Mr. Piatta's studio by men prominent in the mining and quarrying world. Left to right, seated—N. S. Grensfelder, editor, The Explosives Engineer; N. C. Rockwood, editor, Rock Products; W. W. Adams, of the U. S. Bureau of Mines; R. D. Hall, chairman of the mining section, National Safety Council. Standing, left to right—A. H. Hubbell, editor, Engineering and Mining Journal Press; D. E. A. Charlton, manager, Enginering and Mining Journal Press; W. B. Littell, Engineering College Magazines; K. L. Kennedy, editor, Cement, Mill and Quarry; W. W. Annette, New York manager, Hercules Powder Co.; Begni del Piatta, the sculptor; E. I. La Beaume, of Cross & La Beaume, Inc.

Government Wins Suit to Hold Florida Phosphate Lands

THE United States Supreme court on May 4 denied a writ of certiorari by which the Charleston, S. C., Mining and Manufacturing Co. sought to have it review a decision of the lower federal courts in a suit by the United States involving title to phosphate lands in Florida. The state of Florida in 1906 filed on public lands under the indemnity school selection act of 1845. Its selection was approved by the Secretary of the Interior. The state then sold part of the lands to the Charleston, S. C., Mining and Manufacturing Co. Subsequently, the government filed suit to have the sale set aside on the ground the lands had been selected as agricultural land whereas they contained valuable phosphate deposits and hence were not subject to such selection. The company resisted the suit, declaring the transfer to Florida was regular and that its purchase from the state had been in good faith and could not be revoked. It also contended that the statute of 1845 was enacted long before phosphate deposits were recognized as mineral deposits. The lower courts held for the government in the suit. By the refusal of the Supreme court to review the case, this decision will stand, and these lands will again come under government control.—*Chemical and Metallurgical Engineering.*

June to Be a "No Accident Month" in Cement Industry

UNFORTUNATELY, two photographs intended for the article in ROCK PRODUCTS, May 30, announcing the winning of the Portland Cement Association safety trophy by the Mitchell, Ind., mills of the Lehigh Portland Cement Co., arrived too late to be used in that issue. We therefore publish them herewith. The two gentlemen shown below are the cement mill foremen at Mitchell, Wm. Tanksley and John Sims, who were guests of the Lehigh Valley safety meeting on May 21. Also shown is a group of some of the 185 cement mill superintendents and foremen who attended the Allentown meeting, mentioned in our May 30 issue.

Announcement was made at this meeting of the campaign for a no accident month for the entire portland cement industry in June. H. G. Jabcosen, manager of the accident prevention and insurance bureau of the Portland Cement Association supplies the following information:

"The chance taker is the accident maker."

This is the keynote of "No Accident Month," which is to be observed in June with a safety campaign by nearly all the cement plants in the United States and Canada, making the first time that an entire industry has attempted such a movement.

The drive to dodge danger will be waged aggressively among the 40,000 employees of about 135 cement plants in this country and Canada as a means of reducing the already low accident rate as much as is humanly possible during June. Experience with similar campaigns in individual companies has shown that the safety principles emphasized will be long remembered by the workers.

Campaign Methods

The campaign will be prosecuted with vigor by safety lectures, posting of safety bulletins, distribution of buttons bearing suitable slogans, and charts posted daily showing progress made in avoiding accidents. A competitive spirit will be fostered among the men at different plants and between divisions of the same plant.

"The best safety device is a careful man," is the belief of those sponsoring "No Accident Month," and with this in mind they are concentrating on educating the workman to protect himself and fellow workers.

John Sims and Wm. Tanksley

After superintendents and foremen have laid the foundations of the safety activities by talking to the workmen, bulletins will be posted in conspicuous places about the plant with such slogans as the following:

"Care is better than dare."

"A careless man isn't fair to his wife and children."

"Be safe today and live to work another day."

A new bulletin will be posted each day, and the interest of the workers will be further stimulated by a calendar on which the progress of the plant is graphically pictured by crossing off with a colored marker each day on which no accident happens. Each workman will also wear a button with the slogan "Safety Campaign. No Accidents in June."

This campaign is being fostered by the Portland Cement Association, which is maintained by about 90% of the portland cement manufacturers in this country. The association is the service and promotional organization of the industry and includes in its work the prevention of accidents at the cement mills.

Accidents Decreased

Last year accidents to cement workers decreased 18.6% below the 1923 rate in proportion to the man-hours worked; and in 1923, while the accident rate for industry as a whole was increasing, the cement industry showed a decrease of 17% below its accident rate in 1922.

Two years ago the Portland Cement Association began giving a safety trophy in the form of a sculptured group to the cement company having the least number of accidents for the year. Figures just completed show that the Lehigh Portland Cement Company won the trophy for 1924. Its plant at Mitchell, Ind., went through the year with only five minor accidents. The award was made to workmen representing this plant at the spring meeting of the Portland Cement Association, held in New York, May 18, 19 and 20. This will act as a spur to the efforts of the cement companies in their nation wide campaign in June.

Some of the 185 Lehigh Valley cement mill superintendents and foremen who attended the Portland Cement Association Safety Meeting at Allentown, Penn., May 21

Receiver Asked for Tidewater Portland Cement Company

A RECEIVERSHIP for the Tidewater Portland Cement Co., Baltimore, Md., a $4,000,000 corporation, which has a plant at Union Bridge, Carroll county, Md., was asked by W. A. Spurrier, of Baltimore, and the Farrell Fuel Corporation of Pennsylvania. The company is alleged insolvent.

In an answer to the petition filed in the United States court the Tidewater company admits the allegation and consents to the appointment of receivers.

Financial News and Comment

Union Rock Company Bond Offering

THE California Co., Dean, Witter and Co. and District Bond Co., Los Angeles, Calif., are offering at prices ranging from 100 and interest to 101 and interest to yield 6 to 7%, according to maturity, $1,000,000 first mortgage 7% serial gold bonds of the Union Rock Co., Los Angeles.

Dated May 1, 1925, due annually May 1, 1926, to 1927 in denomination $1000, principal and interest (M. & N.) payable at Title Insurance and Trust Co., Los Angeles, trustee. Redeemable all or in part, on any date on 30 days notice, at par and interest plus ½ to 1% for each year or fraction thereof of unexpired life, the redemption price is not to exceed 103 and interest.

Company—Is the outgrowth of the consolidation in 1919 of a number of smaller companies. In the early part of 1922 the properties were acquired by the present owners. In the early part of 1925 the company acquired control of the American Crushed Rock Co. with a production of 500,000 tons, giving it a present owned and controlled production of approximately 3,500,000 tons of material annually. Business is the manufacture and sale of crushed rock, crushed gravel, screened gravel and sand, for use in the construction and maintenance of railroads, highways, streets, buildings, irrigation, flood control and reclamation projects. Company owns or controls six plants on the San Gabriel Delta and one plant at Brush Canyon in Hollywood. The combined capacity of these plants is 22,000 tons or 550 carloads of material per 10-hour day.

Earnings—Net earnings availale for interest charges have averaged $474,520 per annum for the past three years, or over 6¾ times maximum interest charges and over three times maximum combined interest and principal requirements for any year.

Sinking Fund—Commencing June 10, 1925, company covenants to pay to the trustee monthly a sum to be used as a sinking fund for the redemption of bonds at maturity, or by purchase in the open market, or by call. This sum will be 5 cents per ton of all materials sold up to 2,000,000 tons in any one year and 1 cent per ton thereafter in that year. Based on present operation, it is estimated that this sinking fund will retire the entire issue in approximately 8½ years.

Asbestos Corporation of Canada Dividends

THE Asbestos Corporation of Canada has declared quarterly dividends of 1% on common and 1½% on preferred stock, payable July 15 to holders of record July 2.

New Issue of International Cement Stock Proposed

A NEWS dispatch in various newspapers recently stated:

A proposal to issue approximately 67,500 shares of additional preferred stock and 100,000 shares of additional common stock is to be voted upon by International Cement Corporation stockholders June 19. Stockholders will be offered new common at $50 a share. Inasmuch as the International common now traded in on the stock exchange is selling between 65 and 70, it is believed that the rights to subscribe to the new common will be attractive.

Bessemer Limestone and Cement Dividends Declared

THE directors of the Bessemer Limestone and Cement Co., Youngstown, Ohio, and Bessemer, Penn., have declared quarterly dividends of 1½% on the common and 1¾% on the preferred stock, payable July 1 to holders of record June 20. The same dividends were paid on the respective issues April 1 and January 1, the latter being the first common stock dividend since 1920.

RECENT QUOTATIONS ON SECURITIES IN ROCK PRODUCTS CORPORATIONS

(These are the most recent quotations available at this printing. Revisions, corrections and supplemental information will be welcomed by the editor.)

Stock	Date	Par	Price bid	Price asked	Dividend rate
Alpha Portland Cement Co.	June 8	100	124	129	1½% quar.
Arundel Corporation (sand and gravel—new stock)	June 8	No par	27⅞	27¾	30c quar.
Arundel Corporation	Feb. 11	50	112	113½	
Atlas Portland Cement Co. (new)	June 8	No par	43	46	1% quar.
Atlas Portland Cement Co. (preferred)	.....	33⅓	.....	.....	
Bessemer Limestone and Cement Co. (common)	.....	.....	.....	.....	1½% quar. July 1
Bessemer Limestone and Cement Co. (preferred)	.....	.....	.....	.....	1¾% quar. July 1
Boston Sand & Gravel Co.	June 5	100	72	72	
Canada Cement Co., Ltd.	June 9	100	104½	104¾	1½% quar. Apr. 16
Canada Cement Co. Ltd. (preferred)	May 29	100	113	113½	1¾% quar. May 16
Charles Warner Co. (lime, crushed stone, sand and gravel)	May 22	No par	21½	24	50c Apr. 10
Charles Warner Co. (preferred)	May 22	100	100	102	1¾% Apr. 23
Giant Portland Cement Co.	June 8	50	28	30	
Giant Portland Cement Co. (preferred)	June 5	50	51¼	.....	3½% semi-ann. June 15
Ideal Cement Co.	June 8	No par	70	72	75c Mar. 31
Ideal Cement Co. (preferred)	June 8	100	109	110	1¾% quar. Mar. 31
International Cement Corporation (common)	June 9	No par	67	68½	$1 quar. June 30
International Cement Corporation (preferred)	June 8	100	104	106	1¾% quar. June 30
International Portland Cement Co. (preferred)	Mar. 1	.....	30	45	
Kelley Island Lime & Transport Co.	June 9	100	103¼	104½	2% quar.
Lehigh Portland Cement Co.	May 9	.....	70	72	1½% quar. Apr. 1
Michigan Limestone and Chemical Co. (preferred)	Apr. 11	100	.....	.....	1¾% quar. Apr. 15
Missouri Portland Cement Co.	June 9	25	59⅛	59⅞	31½c quar. June 1
Pacific Portland Cement Co., Consolidated	June 6	.....	80½	.....	
Pacific Portland Cement Co., Consolidated (secured serial gold notes)	May 25	100	100	100	3% semi-annual Oct. 15
Peerless Portland Cement Co.*	June 9	10	8½	9	
Petoskey Portland Cement Co.*	June 9	10	9	9½	1½% quar.
Pittsfield Lime and Stone Co. (preferred)	.....	100	.....	.....	2% quar. Apr. 1
Rockland and Rockport Lime Corp. (1st preferred)	June 8	100	98	99	3½% semi-annual
Rockland and Rockport Lime Corp. (2nd preferred)	June 8	100	70	.....	3% semi-annual
Rockland and Rockport Lime Corp. (common)	June 8	No par	70	.....	1½% quar. May 1
Sandusky Portland Cement Co. (common)*	June 9	100	99	112½	2% quar. Apr. 1, 100% payable in com. stock, Apr. 1
Santa Cruz Portland Cement Co. (bonds)	May 8	100	103½	.....	6% annual
Santa Cruz Portland Cement Co. (common)	June 6	50	64½	.....	$1 Apr. 1
Superior Portland Cement Co.	Mar. 1	100	.....	120	
United States Gypsum Co. (common)	June 9	20	162	164½	2% quar. June 30
United States Gypsum Co. (preferred)	June 5	100	116	116	1¾% quar. June 30
Wabash Portland Cement Co.*	June 9	.....	60	100	
Wolverine Portland Cement Co.	June 9	10	11¾	12	2% quar.

*Quotations by Watling, Lerchen & Co., Detroit, Mich.

Editorial Comment

Safety Trophies

In our May 30 issue we recorded the winning of the Portland Cement Association safety trophy for 1924 by the Mitchell mills of the Lehigh Portland Cement Co. A year ago the first award of the trophy was to the San Antonio Portland Cement Co. The winner in 1924 just halved the record of the first winner. We can't say how much the awarding of the trophy had to do with these records, but the facts remain—twice as good a record by the winner in 1924 as in 1923.

In this issue we announce the unveiling of the *Explosives Engineers'* trophy, competition for which is open to all quarries and open-pit mines. We suspect, that with the start the portland cement industry has made a portland cement company's quarry will win this trophy. So it is up to other quarries to put up a stiff fight. We believe there is no question that the keener the competition the better the safety records of all competitors will be.

The keystone of successful safety work is *keeping up interest*. As soon as there ceases to be something to excite interest men fall into the same old ways of thoughtlessness and carelessness. It takes fertile brains and careful planning on the part of executives at the various mills and quarries to keep up interest. Therefore they should welcome such schemes of national competition as exemplified in these safety trophy awards. We believe the superintendents and foremen who make notable records deserve signal recognition from the industries they serve, and we are anxious to do our part in giving space to their achievements.

What Is Sand?

Elsewhere in this issue the executive secretary of the National Sand and Gravel Association objects to the use of the word "sand" in such combinations as "slag sand." We presume that he would find a similar objection to the use of "crusher sand" as applied to the smaller sizes of crushed stone when used or suggested as a fine aggregate for concrete.

So far as technical language is concerned, there is as yet no authoritative definition of the word "sand," which states whether or not it should be used to include other substances than natural sand. The American Society for Testing Materials has had such a definition under consideration but has not yet published its pronouncement, if it has come to a decision.

We may, however, point out that the superiority or inferiority of any material as fine aggregate has nothing to do with the definition of the term "sand." Use and convenience is what fixes a word in a language. If a sufficient number of persons elect to use the term "slag sand" to describe slag which is crushed to the fineness of natural sand, and "crusher sand" to describe stone which is crushed to the same fineness, the matter will be decided. And we might further point out that confining the meaning of the word sand to the product of unconsolidated deposits of minerals would rule out many silica sands, including Ottawa standard sand.

Association Activities

We print in this issue the complete text of the United States Supreme Court decision in the Cement Manufacturers' Protective Association case. We urge every operator in the rock products industries to read it carefully. It is the clearest definition of legitimate trade association activities that has yet come forth from Washington, although it is none too clear at that. Apparently the court holds that it is the use to which trade statistics are put rather than their character that constitutes a violation of the Sherman anti-trust law. In other words, we are back to first principles, where a man's own conscience is his best legal guide.

The use of trade statistics is thus recognized as a necessity to modern business. So long as such statistics are not used to take an *unfair* advantage there is no violation of the law. The line between what is a fair and an unfair advantage, or between a fair and an unfair price for a product, is something that every manufacturer can determine for himself; and if his conscience is in normal working order, it should not be necessary for a court to decide the issue for him after an expensive trial.

Moreover, unfair and excessive profits from the production and sale of a basic commodity invariably carry their own punishment. They can not be hidden and are the surest way of inviting new producers into the field; and new production, beyond any rational estimate of consumption, will create havoc in any industry, organized or unorganized.

The publication or general availability of accurate and reliable trade statistics, on the other hand, certainly tends to discourage unnecessary new projects, just as the general circulation of reliable information in regard to methods of manufacture and costs of manufacture pricks the bubble of many a stock-promotion scheme.

The day has come when we must not only sell our commodity but must sell and keep sold the general public on our industry. The only sure way of accomplishing this is constant evidence of fair-dealing and a genuine desire to give public service.

To Hold 1926 Road Builders' Convention in Chicago

THE American Road Builders' Association will hold its 1926 convention and road show at the Coliseum, Chicago, on January 11-15 inclusive, 1926. Detailed information can be obtained by communication with Charles M. Upham, Convention Manager, State Highway Commission, Raleigh, N. C.

Education of Public Recommended by American Construction Council

THE American Construction Council held its fourth spring meeting in New York, May 8 and 9. The formation of a joint committee of the council and American Railway Association, to be composed of representatives from all branches of the construction industry and the railroads for the purpose of conducting a co-ordinated publicity campaign throughout the country on the elimination of construction peaks and depressions; the approval and support of the council's program on better building and financing of homes; and the establishment of regional committees of the council for the important construction areas of the country, were the most significant actions taken at the conferences.

The conference on better building was widely attended by manufacturers and distributors of materials, financial interests, design management, labor and others interested in building erection. The aim of the council as cited at this conference is to restore the old craft pride by educational processes, eliminating the many instances of shoddy and careless construction and the consequent high cost of repairs, replacements and depreciation. Rushed seasonal construction to remedy housing shortage is one of the causes of the erection of inferior buildings.

At the conference of the council on the elimination of construction, peaks and depressions the following resolution was passed as a step toward changing the present wasteful system of intensified operation covering of few months of each year, followed by comparative idleness during the rest of the year.

RESOLVED: It is the sense of this conference that the elimination of construction peaks and depressions can be accomplished only by the education of the public and this education can be brought about only by the united effort of all those interested in and affected by the greater stability of the construction industry—owners, manufacturers and distributors of materials, transportation agencies and public officials, as well as those who have to do with the initiation and prosecution of construction operations.

Therefore be it further resolved that it is the sense of this conference that a general co-ordinating committee to be appointed jointly by the American Construction Council and the railways of the country and to include representatives of appropriate bodies within the industry, be organized in order that the publicity of these associations and agencies can be co-ordinated and unified in a general campaign of publicity for the country as a whole.

William E. Carson Managing Virginia Gubernatorial Campaign

WILLIAM E. CARSON, president of the Riverton Lime Co., Riverton, Va., after a period of comparative rest from active politics, is now working hard to secure the nomination of Harry F. Byrd for governor of the Old Dominion. Down there,

William E. Carson, President of the Riverton Lime Co., Riverton, Va.

where "there ain't no republicans who vote," the real issue is at the democratic primaries. Mr. Carson is using unique and business-like methods and his friends in the lime industry are wishing him success, irrespective of home party affiliations.

H. Dittlinger On Trip To Europe

H. DITTLINGER, president of the Dittlinger Lime Co., New Braunsfels, Tex., and Mrs. Dittlinger, sailed from New York on June 2 for several months of European travel, during which they will visit Italy, France, Switzerland and Germany. Mrs. Dittlinger is a native of Switzerland and Mr. Dittlinger of Germany.

Will Build Road Materials Testing Laboratory at University of Minnesota

CONSTRUCTION of a $70,000 addition to the experimental engineering building at the University of Minnesota to house a state highway laboratory was authorized by the board of regents at its regular session.

Work on the addition, which will be equipped with machinery and apparatus for testing and inspecting road building materials, will begin this summer and will be turned over to the state highway department on a rental basis, to be operated as a branch of the civil engineering department. —*Duluth (Minn.) Herald.*

U. S. Gypsum Erecting Paper Plant at Oakfield, N. Y.

THE United States Gypsum Co. has started the erection of three new buildings to provide for a paper manufacturing plant in connection with their gypsum plant at Oakfield, N. Y., according to the *Buffalo, N. Y., News.* The buildings will be a power house and buildings for the paper-making machinery and paper storage and will adjoin the wallboard manufacturing division of the plant, the paper being intended for use in that product. The new department will employ about 100 men.

Will Erect Limestone Grinding Plant at Staunton, Va.

R. L. JAMES, mine operator and business man of Buckley, Penn., and K. T. Crowley, industrial manager for the Chesapeake and Ohio Ry., have up with the Staunton, Va., Chamber of Commerce the location of a limestone grinding plant there, the initial investment for which will be $150,000. The matter is in the hands of the new industry committee of the chamber for investigation.—*Lynchburg (Va.) News.*

Fire Destroys U. S. Gypsum Storehouse at Oakfield, New York

FIRE of undetermined origin destroyed one of the United States Gypsum Co.'s large storage houses along the West Shore R. R. at Oakfield, N. Y., southwest from the main factory building recently. In the building was stored a large quantity of empty bags. The loss was $30,000.—*Buffalo (N. Y.) Express.*

Ash Grove Lengthening Kilns

PLANS are now under way, according to local papers, for improvements at the cement plant of the Ash Grove Lime and Portland Cement Co. at Chanute, Kan. Its five 8 by 125 ft. kilns are to be lengthened to 200 ft. A new stack for the kilns will also be erected.

Mixed Mortar Plant of the Stewart Sand Company

THE mixed mortar plant of the Stewart Sand Co. of Kansas City, Mo., is now in operation. The plant was only planned last November so the construction has been carried out in a shorter time than is usual with such enterprises.

This plant uses the Blue Diamond system of preparing and mixing mortar, known as the Hay patented process. The original Blue Diamond plant was in Los Angeles, but plants have now been built in a number of other cities, including Cleveland, Boston, Philadelphia, San Francisco and Fort Worth, and it has proved a success everywhere that it has been established.

As most people who are interested know, the Hay process not only mixes the lime mortar but agitates it and ages it, giving it certain qualities which ordinary mixed mortar cannot have. The value of ageing and beating mortar was recognized as long ago as the days of the great Roman builders but it was forgotten except by some of the more careful builders in Europe until the Hay process reintroduced it. The reason for the superior qualities of this aged and beaten lime are supposed to come from an increase in the portion of the material which is in the colloidal form.

At the right of the picture is the classifying plant of the Stewart Sand Co., which treats sand from the Missouri river, not only to classify it into sizes but to remove lignite.

United States Gypsum Company's New Illinois Lime Plant

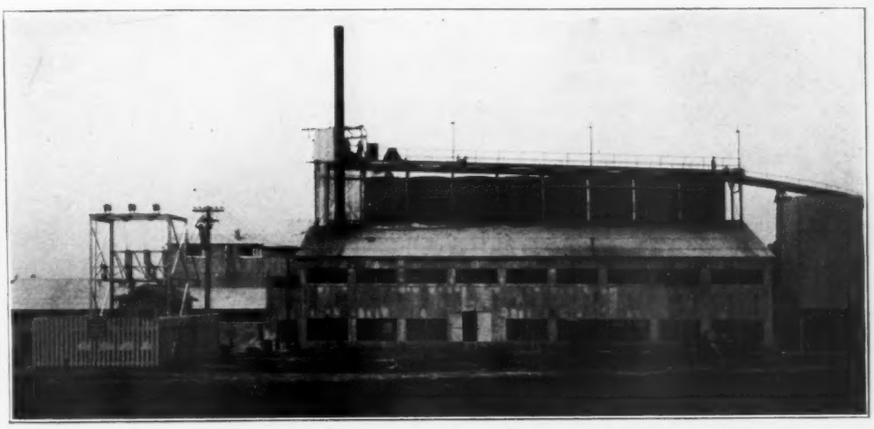
THE United States Gypsum Co., on June 5, put into full operation a new lime plant located one mile south of Cordova, Ill. It consists of eight steel-jacketed kilns of 12-ft. shaft with a daily capacity of 12 tons each, two Clyde (batch-type) hydrators of 60 tons apiece daily capacity, with kiln house, hydrator building and warehouse of permanent ferro-concrete construction.

Power is being supplied by the Tri-City Power Co., which has installed a 13,200-volt transmission line from East Moline to Cordova. Water is being pumped from the Mississippi river, a short distance from the plant. Transportation is provided by the Chicago, Milwaukee and St. Paul railroad. Modern pumping and quarrying equipment, selected in accordance with the company's experience in other lime fields, has been installed.

This property was purchased in 1923 after it was found that a large supply of high quality dolomitic limestone adaptable to the manufacture of mason's hydrate was available. A light overburden has been stripped and preparations have meen made to open a quarry to a depth of 35 ft. for the first level. Construction was begun last fall and has been carried on by a crew of 200 men. The operation will give employment to 40 men.

Its output will be about 125 tons a day of mason's hydrate. It will be distributed in the central and northwestern states, where the acceptance of hydrate instead of lump lime is well established in the building trades. A large part of the output of this plant will be shipped to the United States Gypsum Co.'s plant at Ft. Dodge, Iowa, to supplement the company's mixed car service to building supply dealers.

This is the third lime plant owned by the United States Gypsum Co. It is the first factory operated by this concern in Illinois. The largest is at Genoa, Ohio.



New Cordova, Ill., lime plant of the U. S. Gypsum Co.

New Blue Diamond wet-mixed lime mortar plant of the Stewart Sand Co., Kansas City, Mo.

The South's Building Program

ESTIMATES made by the *Manufacturers' Record* on the building program of 16 southern states show that awards of $340,000,000 have been made in the first four months of 1925. The contracts actually awarded for building projects above $10,000 were $253,231,000 and it is estimated that the smaller buildings will increase this figure by about $90,000,000.

Road, paving and bridge work have first place in the amount of money expended and bank and office buildings are in the second place.

Death of Samuel Pickels

SAMUEL PICKELS, who organized the Bowling Green Quarries Co., Bowling Green, Ky., and was for several years president of that company, died at his home on May 24, at the age of 68 years. Mr. Pickels was born in Yorkshire, England, in 1857.

On account of failing health, he sold his holdings in the company about a year ago and retired. He was prominent in the industrial life of the county and a member of Bowling Green Lodge No. 320, B. P. O. E.

What Is Sand?

Editor ROCK PRODUCTS—

SIR: I have observed your comments in your editorial published May 2 regarding the use of "slag sand" as fine aggregate, and that you inform your readers that a large producer of crushed slag has employed a "consulting engineer of national reputation" who has discovered that, by careful attention, a "slag sand" can be produced which is suitable in concrete work.

I should like to suggest that there is no such commodity as "slag sand." Slag is a by-product of iron furnaces, which was formerly wasted; sand is an unconsolidated rock material. There is no relation between the two, and "slag sand" is clearly a misnomer. Of course, there have been attempts to use slag screenings for fine aggregate, but I think it is fair to insist that no reference to this use of slag should be connected with the word "sand."

I am interested in learning that a private investigator, in the employ of a slag company, has found that slag screenings make a good fine aggregate. A. T. Goldbeck, Chief, Division of Tests, U. S. Bureau of Public Roads, in making his report on the extensive investigations of the Bureau last year, prepared an article entitled "Recent Conclusions in Highway Research." In this article, which I believe appeared in a recent issue of ROCK PRODUCTS, he stated, among other things, that "slag or stone screenings are, in general, unsatisfactory as substitutes for natural sand as fine aggregate in concrete road construction."

This conclusion of Mr. Goldbeck's, representing as it does the finding of an unprejudiced, unbiased agency, seems to me to be worthy of more consideration than the report of an unidentified man who is employed by a slag company. I am led to think that in making his report on the suitability of "slag sand," the wish was father to the thought.

Solely from the standpoint of friendly cooperation, may I ask that you publish this letter in an early issue of your excellent magazine? This association, of course, claims no copyright of the word "sand," but as the representative of companies in all sections of the country with many millions of dollars invested in the proper production and preparation of natural sand, I think that in all fairness we are privileged to state our objections to any such hybrid expression as "slag sand."

T. R. BARROWS,
Executive Secretary, National Sand and Gravel Association.

R. P. Brown Going To Europe

R. P. BROWN, head of the construction department of the National Lime Association, is leaving soon for a European vacation trip. He has accepted invitations to meet and address lime manufacturers' associations in Great Britain.

Rock Products Has London Representative

ROCK PRODUCTS has long had many subscribers and friends in Great Britain and on the continent, and it is therefore with satisfaction we announce that arrangements have been made with Dorland International, Dorland House, 14 Regent St., London, S. W. 1, to represent ROCK PRODUCTS abroad.

Where "Rock Products" may be located in London

The ground floor of Dorland House is occupied by the United States Steamship Lines. On the mezzanine floor is an American newspaper and magazine reading room where copies of ROCK PRODUCTS will be kept on file, and where any information in regard to ROCK PRODUCTS' advertising and subscription rates may be obtained.

Traveling Americans will find this reading and writing room equipped with every facility for their convenience and information, and all subscribers and readers of ROCK PRODUCTS are invited to avail themselves of these facilities.

Our good friend, C. M. Doolittle, president of the Canada Crushed Stone Corp., Ltd., Dundas, Ont., is kind enough to refer to ROCK PRODUCTS in some recent promotional literature as "the leading British and American publication dealing with the technique of concrete, stone, gravel and construction materials." We sure will try and live up to that sub-title.

Engineers Study Inundation Method of Making Concrete

FORTY-THREE of the leading subway engineers of the United States were recently entertained by the Blaw-Knox company at its factory near Pittsburgh, Penn., and inspected the concrete work at the University of Pittsburgh stadium, which is being mixed by the inundation method.

The inundation method uses a device made by the Blaw-Knox company which is known as an inundator. This device works on the principles that any specific sand when saturated with water always occupies the same volume, and that the water contained in this volume is always the same. There is a can of adjustable capacity into which water is put and sand added until the can is full, any excess water overflowing. This can full of saturated sand is added to the coarse aggregate and cement in the mixer along with another measure of water to make up what is needed for the batch. Hence all the ingredients of the mix are definitely measured, cement, water, sand and coarse aggregate, and all difficulties from the bulking of sand or of an uncertain moisture content in the sand are obviated.

Twenty thousand yards of concrete are being put in the stadium by the Turner Construction Co., the contractors. The stadium will seat 70,000 when completed.

Prominent engineers and contractors at Pittsburgh study inundation method of making concrete

Traffic and Transportation

By EDWIN BROOKER, Consulting Transportation and Traffic Expert
Munsey Building, Washington, D. C.

Proposed Changes in Rates

THE following are the latest proposed changes in freight rates up to the week beginning June 8:

Central Freight Association Docket

10756. Gravel and sand from Whartons, Ind., to Walkerton, Ind. Present rate, 9½ cents; proposed, 76 cents per net ton, to apply via N. J. I. & I. R. R.; Pine, Ind., Wabash R. R.; North Liberty, Ind., N. Y. C. R. R.

10757. Crushed stone. Delphos, Ohio, to points in Ohio. Present rates, sixth class; proposed, 60 cents to Lima, Middlepoint and Van Wert, Ohio; 70 cents to Eola; 75 cents to Dixon, Ft. Wayne; 80 cents to Dunkirk; 88 cents to Arcola; 90 cents to Akron; 92 cents to Princeton; $1.05 to Warsaw; $1.16 to Atwood; $1.12 to Etna Green; $1.27 to Bourbon, and $1.32 per net ton to Plymouth, Ohio.

10768. Agricultural lime. Woodville, Ohio, to Edon, Ohio. Proposed, 11½c.

10769. Sand and gravel. Leetonia and East Liverpool, Ohio, to Bayard and Minerva, Ohio. Present rates: From Leetonia, Ohio, to Bayard, Ohio, 90 cents; to Minerva, Ohio, $1. From East Liverpool, Ohio, to Bayard, Ohio, 80c; to Minerva, Ohio, 80c. Proposed rate, 70c per 2000 lb.

10783. Sand and gravel. Elkhart, Ind., to South Bend and Rolling Prairie, Ind. Rates in cents per ton of 2000 lb. To South Bend, Ind., proposed, 65; present, 69. To Rolling Prairie, Ind., proposed, 65; present, 72.

10791. Sand and gravel. Elkhart, Ind., to Rugby (Lydick, Ind.) Present rate, 10 cents; proposed rate, 76 cents per net ton.

10804. Limestone, ground or pulverized. Piqua, Ohio, to Owensboro and Henderson, Ky. Present rate, $3.75 to Owensboro and $3.42 per net ton to Henderson, Ky.; proposed, $3.28 per net ton.

10806. Crushed stone. White Sulphur, Ohio; 70 cents to Highwat, Doneys, Brice, Pickerington, Harrley, Basil, Baltimore and Thurston, Ohio; 80 cents to Rushville, Bremen, Flagdale, Junction City, New Lexington, Clay Bank, Moxahala, Rendville, Corning Hebron, Lakeside Park, Millersport, Ohio; 90 cents per net ton to New Salem, Thornville, Walser, Yost, Glenfort, Glass Rock, Mt. Perry, Fultonham, White Cottage, Elizabeth, Darlington, Zanesville, Burr Oaks, Palos, Glouster, Trimble, Jacksonville and Millfield, Chauncy, Hocking, Armitage, Athens, Fultonham, Canton, Saltillo, Crooksville, Tropic, Misco, Sayre, Tatmans, Rendville, North Corning, Congo, Drakes, Buckingham, Hemlock, Carrington, and Shawnee, Ohio.

10825. Crushed stone. Keeport, Ind., to Logansport, Ind. Present, 50 cents per net ton; proposed, 30 cents per net ton.

10826. Crushed stone and articles taking same rates. Spencer, Ind., to South Linton, Ind. Present rate, 76 cents per net ton; proposed, 70 cents per net ton.

10831. Crushed stone. Monon, Ind., to Crown Point, Ind. Present rate, 92 cents per net ton; proposed, 77 cents per net ton.

10834. Sand, blast, engine, foundry, glass, loam, molding or silica. Geauga Lake, Ohio, to Buffalo, N. Y. Present rate, $2.02 per net ton; proposed, $1.76 per net ton.

10835. Crushed stone and crushed stone screenings. Bedford, Coxton and Oolitic, Ind., to Alton, Ill. Present rate $2 per net ton; proposed, $1.50 per net ton.

10838. Sand and gravel. Merom and Riverton, Ind., to Benton, West Frankfort, Johnston City and Marion, Ill. Present rates, $1.26 to Benton, Ill.; $1.39 to West Frankfort and Johnston City, Ill., and $1.51 per net ton to Marion, Ill. Proposed, $1.12 per net ton.

10839. Sand and gravel and crushed stone. Kenton and Marion, Ohio, to Pavonia and Summit, Ohio, and Milton, Ohio. Present rates, 80 cents per net ton from Marion, Ohio, to Milton, Pavonia and Summit, Ohio, and 90 cents per net ton from Kenton, Ohio, to Milton, Pavonia and Summit, Ohio; proposed, 70 cents per net ton from Marion, Ohio, to Milton, Pavonia and Summit, Ohio, on sand, gravel and crushed stone and 80 cents per net ton from Kenton, Ohio, to Milton, Pavonia and Summit, Ohio, on crushed stone, carloads.

10842. Stone, viz., crushed, broken, chatts, chip, ganister, ground granite, crushed ground, macadam, marble chips, riprap, rubble, slag crushed screenings, stone dust. Carloads, minimum rate marked capacity of car, Bloomington, Clear Creek, Dodgson, Quarry Junction and Victor, Ind., rate of $1.01 to Worthington and Romona, Ind., $1.04 to Gosport, $1.07 to Whitaker and Martinsville and $1.22 per net ton to Campbells and Mars Hill station, Ind. Present rates, sixth class.

10852. Sand and gravel. South Dayton, Ohio, to Lima, Ohio, and Marietta, Ohio. Present, $1 to Lima and $4 per net ton to Marietta, Ohio; proposed, 90 cents per net ton to Lima, Ohio, and $1.50 per net ton to Marietta, Ohio.

10861. Sand and gravel. Marion, Ind., to Gas City, Mill Grove, Dunkirk, Red Key, Ridgeville, Winchester, Sweetser, Converse, Bunker Hill, Kokomo, Portland, Union City, Fairmount, Matthews, Anderson, Muncie and New Castle, Ind. Present rates, sixth class; proposed, 76 cents per net ton to Gas City, Mill Grove, Dunkirk, Red Key, Ridgeville and Winchester, Ind.; 80 cents to Sweetser, Converse, Bunker Hill and Kokomo, Ind.; 84 cents to Portland, Ind.; 88 cents to Union City and Fairmount, Ind.; $1 to Matthews and Anderson, Ind., and $1.01 to Muncie and New Castle, Ind. Proposed rates to apply for Pennsylvania R. R. delivery only.

Illinois Freight Association Docket

3067A. Stone, crushed. Carloads, from Marquette (formerly Gulf Junction), Mo., to destinations in southern Illinois on the Mo. Pac. R. R., e. g., per net ton. McClure, Reynoldsville, Wolf Lake, Johns Spur, Gorham, proposed $1.10; Cora City, Rockwood, Chester, Modoc, DeSota, Marion, Johnson City, proposed $1.20.

3189. Sand and gravel. Carloads, from Pekin, Ill., to Compro, Ill. (Rates in cents per net ton.) Present, 113; proposed, 101.

Trunk Line Association Docket

12578. (Increase.) To increase rate of 80 cents to 90 cents per 2000 lb. on stone, crushed (will not include agricultural limestone or ground limestone unburnt or fluxing stone or fire stone). Carloads, minimum weight 90% of marked capacity of car, except when car is loaded to cubical or visible capacity, actual weight will apply, from Lemoyne and Steelton, Penn., to Thompsontown, Penn. Reason for this proposal: Rates fairly comparable with others for like distances.

12580. (Increase.) To establish rates on limestone, ground, precipitated or pulverized and limestone dust. Carloads, minimum weight 50,000 lb., from Atlas, Hamburg and Lime Crest, N. J., to Mountainville, West Cornwall, Vails Gate Junction, N. Y., 8½ cents and Pine Island, N. Y., 8 cents per 100 lb. Reason for this proposal, proposed rates are comparable with rates published from Ogdensburg, N. Y.

12581. To establish rates on sand (other than glass, engine, blast, foundry, molding and silica) and gravel. Carloads, minimum weight 90% of marked capacity of car, from Silver Springs, N. Y., to Erie R. R. points 75 cents to $1.20 per net ton. Reason for this proposal, to place rates on proper basis.

Western Trunk Line Docket

4461. Stone, rough; stone, broken, crushed or ground; blocks, pieces or slabs; domestic quartzite. From Jasper, Minn. (In cents):

To	Present	Proposed
Chanute, Kan.	32½	19½
Ft. Scott, Kan.	29½	19½
Iola, Kan.	32	19½
Humboldt, Kan.	32	19½
Mildred, Kan.	32	19½
Fredonia, Kan.	36½	23
Independence, Kan.	38	23

Minimum weight 36,000 lb.

342F. Sand. Carloads, from Clay Center, Kan., to Belleville, Kan. Present, 4 cents per 100 lb.; proposed, 3½ cents per 100 lb. Standard minimum weight basis.

4596. Sand. Carloads, from Little Kaw, Kan., to St. Louis, Mo. Present, Class E rate, 17 cents per 100 lb.; proposed, 13 cents per 100 lb. Minimum weight 90% of marked capacity of car, except when weight of shipment loaded to full visible capacity of car is less than 90% of marked capacity of car, the actual weight will apply, but in no case should the minimum weight be less than 40,000 lb.

4605. Stone, rough quarried blocks and slabs sawed two sides or less, not further finished. Carloads, from St. Louis, Mo., and points taking same rates to Wichita, Kan. Present, Class E rate, 29½ cents per 100 lb.; proposed, 17 cents per 100 lb. Minimum weight 50,000 lb.

Southwestern Freight Bureau Docket

4839. Asphalt rock. To establish a rate of 25 cents per 100 lb. on asphalt rock, carloads, minimum wegiht marked capacity of car, but not less than 60,000 lb., from Sulphur, Okla., to Manchac, La. Shippers state that the present class basis is prohibitive and will not enable to move this commodity.

4840. Gravel. To establish Column 1 joint line scale of rates as published in S. W. L. Tariff 114-A on gravel, carloads, minimum weight 80,000 lb. or marked capacity of car if less than 80,000 lb. from points in Arkansas to points in Texas up to and including a distance of 250 miles. Shippers state that with the present rates they are not in a position to move any of the traffic from points in Arkansas in view of which it is contemplated to establish the scale outlined.

New England Freight Association Docket

8265. Stone, broken or crushed. Minimum weight 90% of marked capacity of car. Branford (Pine Orchard Quarry), Conn., to East Providence Wharf and Fox Point, R. I., $1 per net ton (to expire with September 30, 1925). Reason, to permit new movement of traffic.

8266. Granite, rough quarried. Fitchburg, Mass., to Poughkeepsie, N. Y., via N. Y., N. H. & H. R. R. (includes B. & M. switching at Fitchburg, Mass.). Reason, to permit new movement of traffic.

8282. Sand. Minimum weight 60,000 lb. East Swanton, Vt., to Montreal, $1, to St. Lambert and Grand Ligne, Que., 95 cents per net ton. Reason, this basis is comparable with joint rates already in effect.

Southern Freight Association Docket

20683. Stone nad marble, broken or crushed. Carloads, from Tate, Ga., to Madisonville, Ky. Present rate, $3.49; proposed, $2.60 per net ton, made in line with rates in effect from and to other points in the same territory.

20703. Sand and gravel. Carloads, from Arundel Siding, Old Dominion Siding and Ellerslie, Va., to Waverly, Va. (intrastate). Lowest combination now applies. Proposed, 93 cents per net ton, same as in effect to Kilby and Suffolk, Va.

20734. Stone, crushed and ground. Carloads, from Bowling Green and Memphis Junction, Ky., to Milan, Tenn. Present rate, $1.40; proposed, $1.08 per net ton; from Franklin, Tenn., to Bells, Tenn. Present rate, $1.70; proposed, $1.30 per net ton; from Franklin, Tenn., to Mason, Tenn. Present rate, $1.80; proposed, $1.60 per net ton.

20785. Granite or stone blocks or slabs. It is proposed to establish rates on granite or stone blocks, slabs, carloads, from Norfolk and Suffolk, Va., to local stations on the Norfolk Southern R. R., Elizabeth City, N. C., and south, as same as applicable to common points beyond. Class A rates now apply.

20799. Stone, marble or slate, broken or crushed. Carloads, from Fairmount and Bolivar, Ga., to Salem, N. J. Present rates, combination. Proposed, $6 per net ton, made in line with present rates on ground limestone and ground barytes, carloads, from Cartersville, Ga., to Salem, N. J.

20834. Lime. Carloads, from Calera and Roberta, Ala., to Eastern cities. It is proposed to establish the following reduced rates: To New York, N. Y., 42½ cents; Philadelphia, Penn., 38 cents; Baltimore, Md., 33 cents; Washington, D. C., 31 cents per 100 lb. Proposed rates are made with relation to present rates from L. & N. R. R. kilns to Philadelphia, Penn.

20848. Sand and gravel. Carloads, from Carrollton, Ky., to LaGrange, Pendelton and Sulphur, Ky. Present rate, $1.30 per net ton; proposed, $1 per net ton. Intrastate.

20857. Stone, granite or marble, natural or artificial; blocks, pieces or slabs, chiseled, dressed or hammered, loose or in packages in straight or mixed carloads. Minimum weight 36,000 lb.; or when mixed with blocks, pieces or slabs, rough quarried, sawed or sand rubbed, loose or in packages, minimum weight 36,000 lb. from Jacksonville, Fla. (from beyond), to Sarasota, Fla. Present rate, 24¾ cents per 100 lb. Proposed, 19½ cents per 100 lb., made in line with rates applicable on other building materials.

20862. Slag. Carloads, from East Birmingham and Woodward, Ala., to Brookhaven, Miss. Present rate, $2.30 per net ton (Birmingham, Ala., combination); proposed, $1.80 per net ton, same as in effect from Birmingham, Ala.

New Scale for Sand and Gravel Into North Dakota

A DISTANCE scale to be used in making rates on sand, gravel and crushed rock, which also includes crushed stone, to be used not later than July 20, in making rates from Minnesota into North Dakota, has been prescribed in No. 14068, Hopeman Material Co. et al. vs. Northern Pacific et al., mimeographed, to enable North Dakota intrastate scale shown in the report written by Commisioner Campbell. Existing rates were condemned as unreasonable and reparation on past shipments awarded.

The report also covers I. and S. No. 1674, gravel and sand from Barnesville, Downer and Downer Pit, Minn., to Fargo, N. D.; and No. 14162, Industrial Commission of North Dakota vs. Northern Pacific.

The findings in the two formal cases, according to the *Traffiic World*, were that the rates from Muskodo, Detroit, Melvin and Downer, Minn., to Fargo and other points in North Dakota were unreasonable; likewise the rates on crushed rock from Duluth, Saint Cloud, and Sauk Rapids, Minn., to Emerado, Fargo and other points in Minnesota; and likewise as to rates on gravel, from Melvin, Minn., to Grand Forks, N. D., in which reparation was also awarded. In the suspension docket case the finding was of non-justification for proposed increased rates on sand and gravel.

The scale to be used in the making of new rates on sand, gravel and crushed rock, is as follows:

Distance	Cents
50 miles and under	3.5
60 miles and over 50	4
70 miles and over 60	4.5
80 miles and over 70	5
90 miles and over 80	5.5
100 miles and over 90	6
115 miles and over 100	6.5
130 miles and over 115	7
145 miles and over 130	7.5
160 miles and over 145	8
175 miles and over 160	8.5
200 miles and over 175	9
225 miles and over 200	9.5
250 miles and over 225	10
275 miles and over 250	10.5
300 miles and over 275	11
325 miles and over 300	11.5
375 miles and over 325	12

The scale is for single and multiple-line application, one cent per 100 lb. being added for multiple-line hauls.

Alabama Rock Asphalt Shows Increased Production as Freight Rates Lower

OPERATIONS in the rock asphalt field of Colbert county have quickly responded to the recent announcement that a lower freight rate had been approved by the Interstate Commerce Commission after permission had been asked by the Southern Ry. to reduce the rate. The request of the Southern Ry. came as a result of the activities of the Florence, Ala., Chamber of Commerce Traffic Bureau.

Already the production of the Alabama Rock Asphalt Co. has been greatly increased. One week there were 12 cars carrying 600 tons shipped by this company. Next week 24 cars were shipped and the following week 48 cars were to be shipped. This remarkable increase in production strikingly shows the value of the right freight rates and indicates the importance of the work done by the traffic bureau.

The Alabama Rock Asphalt Co. and the Cherokee Rock Asphalt Co. are the two concerns in operation in the asphalt field in Colbert county and others are prospecting.

Soon after it became known that the rates on asphalt rock would be put on a par with those on crushed stone some interested concerns had drills sent in to use in prospecting to find a suitable location for a plant.

The Alabama Rock Asphalt Co. is operating in limestone rock asphalt and the Cherokee company is working in sandstone asphalt. Both these companies are prepared to increase their production rapidly.—*Florence (Ala.) News.*

Another report states that the Colbert Lime-Rock Asphalt Co. plans to construct a $100,000 lime-rock asphalt plant on a 550-acre tract in Colbert county near Sheffield, Ala. The company's office is at 616 Eastgate avenue, St. Louis, Mo., care of J. R. Scott.

Hold Hearing on Southeastern Cement Rates

INVESTIGATION into freight rates applying on shipments of cement in the Southeastern States was begun at Atlanta, Ga., recently before Examiner John T. Money, of the Interstate Commerce Commission, and a committee representing the various railroad commissions of the Southeastern States.

The case was instituted by the Lehigh Portland Cement Co. and other cement companies in an effort to obtain reduction of the cement rate in this territory. The case of the complainants was represented at Washington on March 9, and the present hearing was called in Atlanta to hear the views of the carriers.

Other cement companies represented at the hearing were: Hercules Cement Corporation, Kosmos Portland Cement Co., Sandusky Portland Cement Co., Hermitage Portland Cement Co., Phoenix Portland Cement Co., Dixie Portland Cement Co., Marquette Portland Cement Co., International Cement Corporation, Southwestern Portland Cement Co. and the Security Cement and Lime Co.

Installing Continuous Hydrator at Porto Rico Lime Plant

THE McGann Manufacturing Co., York, Penn., is installing a Schulthess continuous hydrator for George Bird Arias, Fajardo, Porto Rico. This hydrating plant replaces a batch hydrator and is designed, manufactured and will be put into operation by the McGann company.

Indiana Crushed Stone Company Complains of Rates

THE Mid-West Crushed Stone Quarries Co., Indianapolis, Ind., which has plants at Spencer and Greencastle, filed a petition with the public service commission complaining against the rates which, the petition said, railroad companies serving the company from these plants, is charging for transportation of the company's products. The charge was that the rates are unreasonable, unjust and unduly preferential and prejudicial. The application asked that the commission investigate the rates. The railroads named in the petitions were the Pennsylvania R. R., C. & E. I., Monon route, Chicago, Milwaukee & St. Paul, C., I. & W., B. & O., Illinois Central, Nickel Plate and the L. & N.—*Indianapolis (Ind.) News.*

Revise Nebraska Sand and Gravel Rates

THE Nebraska railway commission has issued an order on the Burlington R. R. that will, in the future, open all of the sand pits in the state to the advantages of the distance tariff. Heretofore, the railroads have insisted on using the nearest big town as the rate basing point, objecting to the distance tariff being applied to sand pit locations because it would then apply to all commodities. The commission makes this impossible, however, by providing in the order that it shall apply only on carload lots of sand and gravel. The commission says that the sand and gravel business in Nebraska is highly competitive, and that it is to the benefit of the public as well as of the dealers that each be given whatever advantage there lies in his location to enter whatever markets he may reasonably expect to sell in at a profit.—*Sioux City (Iowa) Tribune.*

Recent Developments in French Bauxite

BAUXITE deposits in southern France are expected to take on a considerable development in the near future by reason of new uses for the mineral. The growth of the aluminous cement industry is one of these; two important French companies and a newly installed British company in France being engaged in making this cement. Aluminum metal and wire is being used more than ever in electrical industries. Large quantities of bauxite ore are still being exported to Holland and Germany, and to the United States in lesser quantities, through the Mediterranean port of Toulon.

Italy is also developing recently exploited bauxite deposits. French deposits of bauxite mineral are estimated at 60,000,000 metric tons, running from 55 to 60% of pure alumina. French production of aluminum metal in 1923 was 17,000 metric tons, out of a world production of 64,800 metric tons.—*Chemical and Metallurgical Engineering.*

Cement Products

Roslyn Concrete Products Company

Business That Has Built Up a Strong Market Near Philadelphia by Making a "Quality" Product

THE Roslyn Concrete Products Co. took its name from the town where it began business, which is a suburb of Philadelphia. But some of the people of Roslyn did not appreciate the advantages of having a supply of good building material conveniently placed and managed to secure an injunction forbidding the operation of the plant. So the business was moved to North Glenside, one of the many growing towns near Philadelphia.

Work was begun in what had been the warehouse of a concern that makes chicken grit, and which still informs the world that "hen's teeth are scarce." A single Besser automatic machine is employed. At the time the plant was visited the blocks were being cured first in the shed and afterward in the yard, but a steam curing room was being built of concrete block as shown in one of the pictures.

Left—Office and yard of Roslyn Concrete Products Co. Right—Building a new steam curing room

Left—Curing in yard. The dark blocks have just been taken from the curing room. Right—Shipping blocks

Slag is mainly used for aggregate and it is preferred on account of its lighter weight. Faced blocks are made wholly of New Jersey concrete sand which is light colored and makes a very pretty block both in color and texture. This sand requires a little more cement than the mixture of slag and sand used for the other blocks. All blocks are thoroughly cured in the yard before being shipped to the job.

In spite of the handicap of changing location and having to occupy insufficient quarters, the business has been built up until it is among the larger producers of block near the city. The reason given the writer by one familiar with the trade around Philadelphia was that the Roslyn plant makes an excellent block and never has made or sold any other kind. It is the oft repeated story of success of a quality product in competition with a cheaper but inferior product.

Philadelphia concrete products men recently formed an association and the manager of the Roslyn plant, W. E. Thornton, is vice-president of the Association.

Advocating Use of Concrete Products to Save Timber

THE following is an editorial which appeared in the *New York Commercial* for May 2:

"That New York State, formerly one of the leading lumber producing states of the Union, has dropped to twenty-sixth place in point of output, is the interesting statement of P. F. Schofield, chairman of the Committee of Forests, appointed by the New York Board of Trade.

"In a recent statement he held that four million acres, formerly comprising forest land, should be reforested.

"That devastation wrought in our forest reserves in the last century has been largely due to our wasteful habit of building of timber because of its apparently low first cost, is generally conceded.

"A study of the building permits issued in different cities of the country today shows a rapidly growing trend toward masonry construction, a tendency still further hastened by the fact that with the rapidly decreasing supply of lumber, its increased cost has narrowed the margin between frame construction and masonry to the point where the difference in first cost is often less than the painter's charge for the first time the frame house has to be repainted.

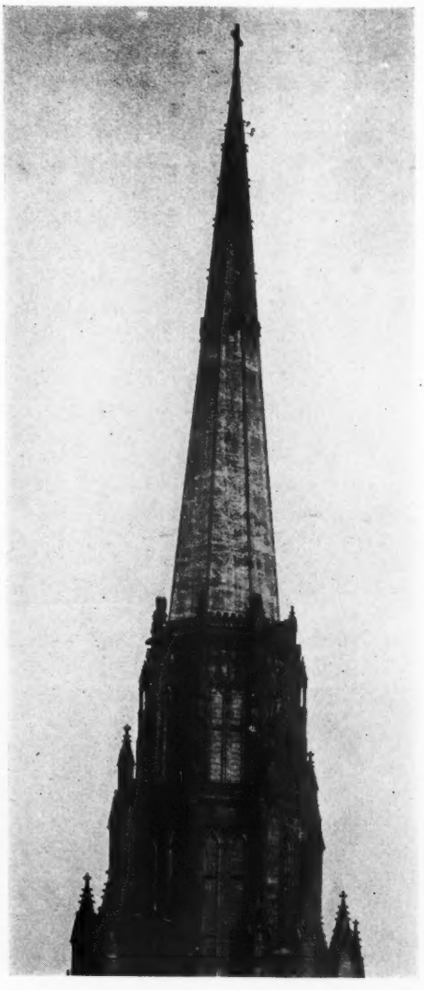
"The development of the hollow concrete wall and the concrete block are due largely to the ever-increasing pressure of public demand for a low cost, permanent, construction to be an improvement over timber.

"While considerable lumber will always continue to be used in house construction, the use of masonry walls will cut down the nation's present appalling fire loss.

"National Forest Week, which ended May 1, had the indorsement of President Coolidge. What the President said served to call public attention to the situation which has been created by the rapid exhaustion of the country's timber resources. The matter is of importance and promises to become a problem of great magnitude within a few years. One of the most logical ways to save the forests is to encourage the use of materials other than wood in all construction work. Stone, cement and brick are time-defying, they reduce the fire hazard, they make for low upkeep costs in all places where they replace lumber, and they are bound to come into constantly increasing use.

How Concrete Is "Self-Cleaning"

THE lofty steeple of the Chicago Temple building, which houses the First Methodist Episcopal Church of Chicago, has attracted the attention of many occupants of nearby buildings, from which the steeple can be seen, because of the growing variation in color between the spire proper, which is of reinforced concrete, and the supporting tower, which is faced with limestone.



The steeple and the stonework below were originally of the same color

When the building was completed, about two years ago, the color of concrete and limestone were so nearly the same that even careful observers without previous knowledge of the materials used, could not tell where one material left off and another began. Today the concrete spire contrasts boldly with the building beneath it.

The Chicago Temple steeple is a typical example of the "self-cleaning" action of concrete surfaces, already noted extensively in connection with concrete cast stone, roofing tile and some other fine surfaced products. The collection of dirt and soot on the limestone indicates its high absorption as well as other characteristics which assist in holding dirt on the surfaces.

Fighting the Dishonest Block

THE secretary of the Wisconsin Concrete Products Association thus writes the members. The advice given is so good that it ought to be passed on to the makers of honest concrete products everywhere:

"Some of our members are complaining that inferior products, both concrete and competitive materials, are going into jobs falling under the jurisdiction of the Wisconsin building code. It is up to our members to see that material which does not measure up to the building code standards is not used in public buildings or places of employment. Knowing about such material and keeping it to yourself will do no good. The fact that it is being used should be called to the attention of the local building inspector or the Industrial Commission.

"I do not believe that anyone should feel that he is 'squealing' when he reports a job on which inferior materials are being used. If you are making a quality product yourself, in order to protect your own good name and that of the industry, you must see to it that the other fellow turns out the same kind of a product and that only quality products are used where quality products belong."

The Building Situation

FIGURES of the F. W. Dodge Corp. show a drop in building permits in the 20 leading American cities from $853,252,092 to $803,236,605, comparing the first four months of 1924 and 1925. New York is the only city with a considerable drop, the figures being $421,725,958 for the period in 1924 and $315,333,426 for the same period in 1925. Chicago shows the greatest gain in volume of construction but it has been exceeded in percentage gain by Kansas City, St. Louis, Seattle, Pittsburgh, Cleveland and Philadelphia. St. Louis and Kansas City have practically doubled the value of building permits in the first four months of 1925 as compared with the first four months of 1924.

Bureau of Standards Requirements for Concrete Block Brick and Tile

THE report of the Building Code Committee of the Bureau of Standards in the elimination of waste series, has been published under the title "Recommended Minimum Requirements for Masonry Wall Construction." The following excerpts have a bearing on the concrete products industry:

"Concrete Block or Concrete Tile.—The average compressive strength of concrete block or tile used for exterior or party walls or piers shall not be less than 700 lb. per sq. in. of gross sectional area tested in position as used in the wall. The absorption of concrete block or tile shall not exceed 10% under a 24-hour immersion test, except that where concrete block or tile have an average compressive strength of over 1200 lb. per sq. in. gross area, or where they are not exposed to dampness, or where they are coated with stucco, the requirement as to absorption may be waived. For block or tile made of concrete weighing less than 140 lb. per cu. ft., the average absorption in per cent by weight shall be not more than 10 multiplied by 140 and divided by the unit weight in pounds per cubic foot of the concrete under consideration. (See Appendix, par. 9-5.)"

The section referred to in the foregoing paragraph, and a preceding section applying to concrete brick are:

"4. Much consideration was given to the requirements for concrete brick. It was at first decided that all brick should be tested on edge in accordance with the specification of the American Society for Testing Materials for building brick. However, in view of the fact that both that society and the American Concrete Institute have issued tentative specifications permitting concrete brick to be tested flatwise, these recommendations were finally changed accordingly. Specifications for concrete brick should be set high enough so that they will not be unduly friable in handling. (See also Appendix, par. 13-1.)

"5. The modification for light concrete is made necessary by the increasing manufacture of units made from light aggregates."

The reference given to Appendix, par. 13-1 also deals with concrete brick and is in part as follows:

"Experiments at Columbia University (see item 16, par. 11) indicate that when laid in portland cement mortar, concrete brick averaging from 1500 to 2500 lb. per sq. in. compressive strength tested flatwise, will make a wall about as strong as one built of clay brick averaging 3000 to 5000 lb. per sq. in. tested edgewise.

"Tests recently made at the Bureau of Standards on piers and walls laid in cement-lime mortar also indicate that masonry of concrete brick has greater strength than that of clay brick having equal unit strength tested individually.

"Test data furnished by the Bureau of Standards indicate that, in general, the compressive strength of brick walls built of several varieties of brick, all laid in cement-lime mortar, varies from 15 to 40% of the strength of the individual brick when the latter are tested flatwise, with the range runing considerably higher when compared with the compressive strength edgewise.

"Tests on concrete brick piers in the investigation at Columbia University mentioned above showed ratios of pier strength to brick strength tested flatwise ranging from 43 to 95% when 1 to 3 portland cement mortar was used. These results were exceptionally high and have been the subject of much discussion."

Spotted Aggregate

THE photograph shows part of a beautiful bridge which is on the boulevard leading out of Philadelphia toward Trenton, N. J. It is not only beautiful in design but it is a beautiful piece of concrete work. The aggregate for facing has been carefully chosen both for its size and color and

Dark brown spots developed from the aggregate

the effect is very much better than the dull, monotonous gray which ordinary concrete presents to the eye.

Unfortunately either the sand or the gravel used for this facing contained substances that disintegrated on exposure and these have formed dark brown spots on the surface. They show very plainly in the photograph. The material of which these spots are composed looks something like iron rust. It is hard and does not scrape off easily with a knife.

There is a somewhat similar disfigurement which sometimes occurs on travertine, and from which has come the story of "bleeding" columns. There is an example of such a column in the new Union station in Chicago. The material from this column was analyzed and found to be a mixture of iron oxide and organic matter. Possibly the spots shown in the picture are of a similar composition.

Making a White Finish on Concrete

IN a recent number of the *Engineering News-Record,* the following account is given of the concrete work on some new highway bridges in Indiana, in which there may be a hint for the concrete worker who desires a different finish for his product.

"Gravel concrete was used throughout, with a mix of about 1:2½:4 for the footings and piers and 1:2:3½ for the spans, the cement content being specified definitely. For the spans, 8 lb. of hydrated lime per sack of cement was added in order to give a dense mix with sufficient plasticity to flow readily around the reinforcing steel and also to show a white surface in the concrete when cured.

"An unusual feature for country road bridges of this class is that all surfaces exposed to view are finished by rubbing with carborundum, except that the panels on parapet walls are bush-hammered to expose the aggregates. For this treatment the side forms are removed in 24 hours and the surface is rubbed with wood floats to remove all form marks and loose cement skin. When the concrete has cured for ten days or more the process is repeated, but with carborundum blocks. No cement or grout is used but only clean water, the effect being to work up a white lather. After a day or two, when the lather has dried, the surface is wiped with burlap to remove all dust and polishing marks. This finish, costing about 10 cents per sq. ft. gives the concrete a clear white color instead of the usual dull gray of common concrete."

Porous Concrete Aggregate Patent

A PATENT, U. S. 1,528,759, for a porous concrete aggregate was secured March 10 by Bernard J. Fallon, covering the process of forming a clay product which consists in first firing a mass of clay in a kiln under oxidizing conditions, then in passing steam through the bed of burning fuel into the presence of the clay and continuing the firing of the clay in the atmosphere so produced.—*Ceramic Abstracts.*

New Clinchfield Cement Plant

THE new $3,000,000 plant of the Clinchfield Portland Cement Co. at Clinchfield, Ga., six miles from Perry, has begun operation. The industry will employ 250 men and will have a capacity of 2000 bbl. per day. It is estimated that there is sufficient material for the plant to operate 100 years.—*Atlanta (Ga.) Georgian.*

The Rock Products Market

Wholesale Prices of Crushed Stone

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Buffalo, N. Y.	1.30	1.30	1.30	1.30	1.30	1.30
Chaumont, N. Y.	1.00	.....	1.75	1.50	1.50	1.50
Eastern Pennsylvania	1.35	1.35	1.35	1.35	1.35	1.35
Munns, N. Y.	1.00	1.40	1.30	1.25	.....	.....
Northern New Jersey	1.50	2.00	1.80	1.40	1.40	.....
Prospect, N. Y.	1.00	1.40	1.40	1.30	1.30	.....
Watertown, N. Y.	.....	.50	1.75	1.50	1.50	1.50
Western New York	.85	1.25	1.25	1.25	1.25	1.25
CENTRAL						
Alton, Ill.	1.85	.....	1.85	1.75	.....	.....
Bloomville, Middlepoint, Dunkirk, Bellevue, Waterville, No. Baltimore, Holland, Kenton, New Paris, Ohio; Monroe, Mich.; Huntington, Bluffton, Ind.	1.00	1.10	1.10	1.00	1.00	1.00
Buffalo and Linwood, Iowa	1.10	1.20	1.20	1.00	1.05	1.05
Chicago, Ill.	.80	1.00	1.00	1.00	1.00	1.00
Columbia, Krause, Valmeyer, Ill.	1.20	1.20	1.20	1.10	1.10	1.10
Cypress, Ill.	1.25	1.15	1.10	1.10	1.10	1.10
Dundas, Ont.	.70	1.05	.90	.90	.90	90
Gary, Ill.	1.00	1.37½	1.37½	1.37½	1.37½	1.37½
Greencastle, Ind.	1.25	1.25	1.15	1.05	.95	.95
Lannon, Wis.	.80	1.00	1.00	.95	.95	.95
Northern New Jersey	1.30	.....	1.80	1.60	1.40	.....
River Rouge, Mich.	1.00	1.10	1.10	1.10	1.10	1.10
Sheboygan, Wis.	1.10	.....	.....	1.10	1.10	.....
St. Vincent de Paul, Que.	.85	1.35	1.05	.95	.90	.90
Stone City, Iowa	.....	.....	1.20†	1.10	1.05	.....
Toronto, Ont.	1.60	1.95	1.80	1.80	1.80	1.80
Waukesha, Wis.	.90	.90	.90	.90	.90	.90
Wisconsin Points	.50	.....	1.00@1.15	.90@1.05	.90@1.05	.....
SOUTHERN:						
Alderson, W. Va.	.60	1.60	1.60	1.50	1.40	.....
Bridgeport and Chico, Texas	1.00	1.35	1.25	1.25	1.20	1.10
Cartersville, Ga.	1.75	1.50	1.50	1.35	1.35	.....
El Paso, Texas	1.00	1.00	1.00	1.00	1.00	.....
Ft. Springs, W. Va.	.60	1.60	1.60	1.50	1.40	.....
Graystone, Ala.	Crusher run fluxing stone, 1.00 per net ton					
Olive Hill, Ky.	1.00	1.00	1.00	1.00	1.00	1.00
Rockwood, Ala.	1.00	.....	.....	1.25	1.00	.....
WESTERN:						
Atchison, Kans.	.25	2.00	2.00	2.00	2.00	1.60‖@1.80
Blue Spr'gs & Wymore, Neb.	.20	1.45	1.45	1.35c	1.25d	1.20
Cape Girardeau, Mo.	1.25	.....	1.25	1.25	1.10	.....
Kansas City, Mo.	1.00	1.80	1.80	1.80	1.80	1.80
Rock Hill, Mo.	1.50	.....	1.25	1.25	1.25	1.25

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Branford, Conn.	.60	1.70	1.45	1.20	1.05	.....
Duluth, Minn.	.90	2.25	1.90	1.50	1.35	1.35
Dwight, Calif.	1.75	1.75	1.75	1.75	1.75	.....
Eastern Maryland	1.00	1.60	1.60	1.50	1.35	1.35
Eastern Massachusetts	.85	1.75	1.75	1.25	1.25	1.25
Eastern New York	75	1.25	1.25	1.25	1.25	1.25
Eastern Pennsylvania	1.10	1.70	1.60	1.50	1.35	1.35
New Haven, New Britain, Meriden & Wallingford, Conn.	.80	1.70	1.45	1.20	1.05	1.05
Northern New Jersey	1.50@1.75	2.00@2.25	1.50@1.80	1.40@1.70	1.40@1.60	.....
Oakland and El Cerrito, Calif.	1.75	1.75	1.75	1.75	1.75	.....
San Diego, Calif.	1.45	.....	1.65	1.30	1.30	1.25
Sheboygan, Wis.	1.00	1.10	1.10	1.10	1.10	.....
Springfield, N. J.	1.75	2.10	2.10	1.70	1.60	1.50
Westfield, Mass.	.60	1.50	1.35	1.20	1.10	.....

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Berlin, Utley and Red Granite, Wis.—Granite	1.50	1.60	1.35	1.25	1.25	1.00
Coldwater, N. Y.—Dolomite			1.50 all sizes			
Columbia, S. C.—Granite	.50	2.00	1.75	.....	1.60	.....
Eastern Penn.—Sandstone	1.35	1.70	1.65	1.40	1.40	1.40
Eastern Penn.—Quartzite	1.20	1.35	1.25	1.20	1.20	1.20
Lithonia, Ga.—Granite	1.50@1.75	1.50	1.50	1.25	1.15	1.15
Lohrville, Wis.—Granite	1.65	1.70	1.65	1.45	1.50	.....
Middlebrook, Mo.—Granite	3.00@3.50	.....	2.00@2.25	2.00@2.25	.....	1.25@2.00
Northern New Jersey (Basalt)	150	2.00	1.80	1.40	1.40	.....
Richmond, Calif. (Basalt)	.75*	.....	1.50*	1.50*	1.50*	.....

*Cubic yd. †1 in. and less. ‖Rip rap per ton. (a) Sand. (b) to ¼ in. (c) 1 in., 1.40. (d) 2 in., 1.30.

Agricultural Limestone

(Pulverized)

Alton, Ill. — Analysis, 97% $CaCO_3$, 0.3% $MgCO_3$; 90% thru 100 mesh	6.00
Pulverized	1.85
Asheville, N. C. — Analysis, 57% $CaCO_3$, 39% $MgCO_3$; 50% thru 100 mesh; 200-lb. burlap bag, 4.00; bulk	2.75
Branchton, Penn. — 100% thru 20 mesh; 60% thru 100 mesh; 45% thru 200 mesh. (Less 50 cents commission to dealers)	5.00
Cape Girardeau, Mo.—Analysis, 93.5% $CaCO_3$, 3.5% $MgCO_3$; pulverized; 90% thru 50 mesh	1.50
Cartersville, Ga. — Analysis, 68% $CaCO_3$, 32% $MgCO_3$; pulverized	3.00
50% thru 100 mesh	1.75
Chaumont, N. Y. — Pulverized limestone, bags, 4.00; bulk	2.50
Chico, Texas—Pulverized	2.50
Colton, Calif.—Analysis, 95% $CaCO_3$, 3% $MgCO_3$—all thru 20 mesh—bulk	4.00
Dundas, Ont., Can.—Analysis, 53.80% $CaCO_3$, 43.31% $MgCO_3$; 35% thru 100 mesh, 50% thru 50 mesh, 100% thru 10 mesh; bags, 4.75; bulk	3.00
Hillsville, Penn. — Analysis, 94% $CaCO_3$, 1.40% $MgCO_3$, 75% thru 100 mesh; sacked	5.00
Jamesville, N. Y.—Analysis, 89.25% $CaCO_3$; 5.25% $MgCO_3$; pulverized, bags, 4.00; bulk	2.50
Knoxville, Tenn.—80% thru 100 mesh, bags, 3.95; bulk	2.70
80% thru 200 mesh, bags, 4.25; bulk	3.90
Linville Falls, N. C.—Analysis, 57% $CaCO_3$, 39% $MgCO_3$; 50% thru 100 mesh; 200-lb. burlap bag, 4.00; bulk	2.75
Marblehead, Ohio — Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$; 60% thru 100 mesh; 70% thru 50 mesh; 100% thru 10 mesh; 80 lb. paper sacks, 5.10; bulk	3.60
Marion, Va. — Analysis, 90% $CaCO_3$, guaranteed; 42.5% thru 100 mesh, 11.3% thru 80, 20.2% thru 60, 22.8% thru 40, 3.2% thru 20 and under or 75% thru 40 mesh; pulverized, per ton	2.00
Mayville, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 90% thru 100 mesh	3.90@ 4.50
Mountville, Va.—Analysis 76.60% $CaCO_3$, 22.83% $MgCO_3$; 50% thru 100 mesh, 100% thru 20 mesh—125-lb. hemp bags	5.00
Olive Hill, Ky.—90% thru 100 mesh	2.00
90% thru 4 mesh	1.00
Osborne, Penn.—100% thru 20 mesh; 60% thru 100 mesh; 45% thru 200 mesh. (Less 50 cents commission to dealers)	5.00
Piqua, Ohio—Total neutralizing power 95.3%; 99% thru 10, 60% thru 50; 50% thru 100	2.50@ 2.75
100% thru 10, 90% thru 50, 80% thru 100; bags, 5.10; bulk	3.60
99% thru 100, 85% thru 200; bags, 7.00; bulk	5.50
Waukesha, Wis.—Pulverized	4.00
Watertown, N. Y.—Analysis 96-99% $CaCO_3$; 50% thru 100 mesh; bags, 4.00; bulk	2.50
West Stockbridge and Rockdale, Mass., Danbury, Conn. — Analysis, 90% $CaCO_3$, 5% $MgCO_3$; pulverized; 50% thru 100 mesh; paper bags, 4.75; cloth, 5.25; bulk	3.25

Agricultural Limestone

(Crushed)

Alderson, W. Va. — Analysis, 90% $CaCO_3$; 50% thru 100 mesh	1.50
Bedford, Ind. — Analysis, 97.5% $CaCO_3$, 1.2% $MgCO_3$; 95% thru 100 mesh, 65% thru 40 mesh, 30% thru 100 mesh	1.50
Bettendorf, Iowa — 97% $CaCO_3$, 2% $MgCO_3$; 50% thru 100 mesh; 50% thru 4 mesh	1.50
Blackwater, Mo.—99% $CaCO_3$; 90% thru 4 mesh	1.00
Bridgeport and Chico, Texas—Analysis, 94% $CaCO_3$, 2% $MgCO_3$; 100% thru 10 mesh	1.75
50% thru 4 mesh	1.50

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Agricultural Limestone

(Continued from preceding page)

Chicago, Ill.—50% thru 100 mesh; 90% thru 4 mesh	.80
Chico, Texas — 50% thru 50 mesh, 50% thru 4 mesh	1.00
Columbia, Krause, Valmeyer, Ill.—Analysis, 90% $CaCO_3$; 90% thru 4 mesh	1.20
Cypress, Ill.—90% thru 100 mesh..... 50% thru 100 mesh, 90% thru 50 mesh, 50% thru 50 mesh, 90% thru 4 mesh, 50% thru 4 mesh	1.25 1.15
Ft. Springs, W. Va.—Analysis, 90% $CaCO_3$; 90% thru 50 mesh	1.50
Garrett, Okla.—All sizes	1.25
Gary, Ill. — Analysis, approx. 60% $CaCO_3$, 40% $MgCO_3$; 90% thru 4 mesh	.60
Kansas City, Mo. — 50% thru 50 mesh	1.25
Lannon, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 99% through 10 mesh; 46% through 60 mesh	2.00
Screenings (¼ in. to dust)	1.00
Marblehead, Ohio.—Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$, 32% thru 100 mesh; 51% thru 50 mesh; 83% thru 10 mesh; 100% thru 4 mesh (meal) bulk	1.60
Mayville, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 50% thru 50 mesh	1.85@ 2.35
Middlepoint, Bellevue, Kenton, Ohio; Monroe, Mich.; Huntington and Bluffton, Ind. — Analysis, 42% $CaCO_3$, 54% $MgCO_3$; meal, 25 to 45% thru 100 mesh	1.60
Milltown, Ind. — Analysis, 94.41% $CaCO_3$, 2.95% $MgCO_3$; 30.8% thru 100 mesh, 38% thru 50 mesh	1.45@ 1.60
Moline, Ill., and Bettendorf, Iowa—Analysis, 97% $CaCO_3$, 2% $MgCO_3$; 50% thru 100 mesh; 50% thru 4 mesh	1.50
Pixley, Mo.—Analysis, 96% $CACO_3$; 50% thru 50 mesh..... 50% thru 100 mesh; 90% thru 50 mesh; 50% thru 50 mesh; 90% thru 4 mesh; 50% thru 4 mesh	1.25 1.65
River Rouge, Mich.—Analysis, 54% $CaCO_3$, 40% $MgCO_3$; bulk	.80@ 1.40
Stone City, Iowa. — Analysis, 98% $CaCO_3$; 50% thru 50 mesh	.75
Waukesha, Wis.—Test, 107.38% bone dry, 100% thru 10 mesh; bags, 2.85; bulk	2.10

Pulverized Limestone for Coal Operators

Hillsville, Penn., sacks, 4.50; bulk	3.00
Piqua, Ohio, sacks, 4.50@5.00 bulk	3.00@ 3.50
Waukesha, Wis.—97% thru 100 mesh, bulk	4.00

Miscellaneous Sands

Silica sand is quoted washed, dried and screened unless otherwise stated. Prices per ton.

Glass Sand:	
Berkeley Springs, W. Va.	2.00@ 2.25
Cedarville and S. Vineland, N. J.—Damp	1.75
Dry	2.25
Cheshire, Mass: 6.00 to 7.00 per ton; bbl.	2.50
Columbus, Ohio	1.50@ 2.00
Estill Springs and Sewanee, Tenn.	1.50
Franklin, Penn.	2.00
Gray Summit and Klondike, Mo.	1.75@ 2.00
Los Angeles, Calif.—Washed	5.00
Mapleton Depot, Penn.	2.00@ 2.25
Massillon, Ohio	3.00
Mineral Ridge and Ohlton, Ohio	2.50
Oceanside, Calif.	3.00
Ottawa, Ill.—Chemical and mesh guaranteed	1.50
Pittsburgh, Penn.—Dry	4.00
Damp	3.00
Red Wing, Minn.: Bank run	1.50
Ridgway, Penn.	1.90
Rockwood, Mich.	2.75@ 3.25
Round Top, Md.	2.25
San Francisco, Calif.	4.00@ 5.00
St. Louis, Mo.	2.00
Sewanee, Tenn.	1.50
Thayers, Penn.	2.50
Utica, Ill.	1.00@ 1.25
Zanesville, Ohio	2.50
Miscellaneous Sands:	
Aetna, Ind.: Core, Box cars, net, .35; open-top cars	.30
Albany, N. Y.: Molding fine and coarse	2.00
Brass molding	2.25
Sand blast	3.60
Arenzville and Tamalco, Ill.: Molding fine and coarse	1.40@ 1.60
Brass molding	1.75
Beach City, Ohio: Core	1.75
Furnace lining	2.50

(Continued on next page)

Wholesale Prices of Sand and Gravel

Prices given are per ton, f. o. b. producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel, ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
EASTERN:						
Ambridge & So. H'g'ts, Penn.	1.25	1.25	1.15	.85	.85	.85
Attica and Franklinville, N. Y.	.75	.75	.85	.75	.75	.75
Buffalo, N. Y.	1.10	.95	.85	.85	.85	.85
Erie, Penn.		1.25		1.50	1.75	
Farmingdale, N. J.	.58	.48	1.05	1.20	1.10	
Hartford, Conn.	.65*					
Machias Jct., N. Y.		.75	.75	.75	.75	.75
Montoursville, Penn.	1.00	1.10	.90	.85	.85	.85
Northern New Jersey	.50	.50	1.35	1.25	1.25	
Olean, N. Y.		.90	.75	.75	.75	.75
Shining Point, Penn.			1.00	1.00	1.00	1.00
South Heights, Penn.	1.25	1.25	.85	.85	.85	.85
Washington, D. C.—Rewashed, river	.85	.85	1.70	1.50	1.30	1.30
CENTRAL:						
Algonquin and Beloit, Wis.	.50	.40	.60	.60	.60	.60
Attica, Ind.	.75	.75	.75	.75	.75	
Barton, Wis.		.60	.80	.80	.80	.80
Chicago, Ill.	1.35‡	1.75‡	1.75‡	1.75‡	1.75‡	1.75‡
Columbus, Ohio	.75	.75	.75	.75	.75	.75
Covington, Ind.	.75	.75	.75	.75	.75	.75
Des Moines, Iowa	.50	.40	1.50	1.50	1.50	1.50
Eau Claire, Wis.	.40	.40	.80			.85
Elkhart Lake, Wis.	.60	.40	.60	.60	.60	.60
Ft. Dodge, Iowa	.85	.85	2.05	2.05	2.05	2.05
Ft. Worth, Texas	2.00	2.00	2.00	2.00	2.00	2.00
Grand Rapids, Mich.		.50		.80	.70	.70
Hamilton, Ohio		1.00			1.00	
Hersey, Mich.		.50				.70
Indianapolis, Ind.	.60	.60		.90	.75@1.00	.75@1.00
Janesville, Wis.		.65@ .75			.65@ .75	
Mason City, Iowa	.45@ .55	.45@ .55	1.35@1.45	1.45@1.55	1.40@1.50	1.35@1.45
Mankato, Minn.		.40	.40a		1.25	
Milwaukee, Wis.		1.01	1.21	1.21	1.21	1.21
Minneapolis, Minn.*	.35	.35	1.35	1.25	1.25	1.25
Moline, Ill.	.60@ .85	.60@ .85	1.00@1.20	1.00@1.20	1.00@1.20	1.00@1.20
Northern New Jersey	.45@ .50	.45@ .50		1.25	1.25	
Palestine, Ill.	.75	.75	.75	.75	.75	.75
Silverwood, Ind.	.75	.75	.75	.75	.75	.75
Summit Grove, Ind.	.75	.75	.75	.75	.75	.75
Terre Haute, Ind.	.75	.60	.90	.90	.85	.85
Wolcottville, Ind.	.75	.75	.75	.75	.75	.75
Waukesha, Wis.		.45	.55	.60	.65	.65
Winona, Minn.	.40	.40	1.25	1.10	1.00	1.00
Yorkville, Sheridan, Oregon, Moronts, Ill.			Average .60			
Zanesville, Ohio.	.70	.60	.60	.60	.90	.90
SOUTHERN:						
Charleston, W. Va.		All sand 1.40 f.o.b. cars.		All gravel 1.50 f.o.b. cars.		
Chehaw, Ala.	00@ .30		.40	.50		
Knoxville, Tenn.	1.00	1.00	1.20	1.20	1.20	1.00
Macon, Ga.		.50		.65	.65	
New Martinsville, W. Va.	1.00	.90		1.30a		.90
Roseland, La.	.45	.40	1.75	1.25	1.00	1.00
Smithville, Texas		.90	.90	.90	.90	.75
WESTERN:						
Baldwin Park, Calif.	.20	.20	.40	.50	.50	
Kansas City, Mo.	.80	.70				
Los Angeles, Calif.	.50	.50	.92	.92	.92	
Los Angeles District (bunkers)†	.80	1.30	1.30	1.30	1.30	1.30
Pueblo, Colo.	1.10*	.90*		1.60*		1.50*
San Diego, Calif.	.60	.60	1.20	1.20	1.00	1.00
Seattle, Wash. (bunkers)	1.50*	1.50*	1.50*	1.50*	1.50*	1.50*

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
Algonquin and Beloit, Wis.			Dust to 3 in., .40			
Boonville, N. Y.	.60@ .80		.55@ .75			1.00
Chehaw, Ala.	00@ .30					
Des Moines, Iowa		Washed, .65; unwashed, .40 (not screened)				
Dudley, Ky. (crushed silica)		1.10		.90		
East Hartford, Conn.			Sand, .65 per cu. yd.			
Elkhart Lake, Wis.	.50					
Gainesville, Texas		.95				.55
Grand Rapids, Mich.				.60		
Hamilton, Ohio					.70	
Hersey, Mich.				.55		
Indianapolis, Ind.			Mixed gravel for concrete work, .65			
Lindsay, Texas		1.10				.55
Macon, Ga.		.35				
Mankato, Minn.			Pit run gravel, .50			
Moline, Ill. (b)	.60	.60	Concrete gravel, 50% G., 50% S., 1.00			
Montezuma, Ind.						.60
St. Louis, Mo.			Mine run gravel 1.55 per ton			
Shining Point, Penn.			Concrete sand, 1.10 ton			
Smithville, Texas	.50	.50	.50	.50	.50	.50
Summit Grove, Ind.	.50	.50	.50	.50	.50	.50
Waukesha, Wis.	.60	.60	.60	.60	.60	.60
Winona, Minn.	.60	.60	.60	.60	.60	.60
York, Penn.	1.10	1.00				
Zanesville, Ohio						.55

*Cubic yd. †Include freight and bunkerage charges. ‡Delivered on job. (a) ¾ in. down. (b) River run.

Miscellaneous Sands

(Continued from preceding page)

Molding fine and coarse		2.00
Traction unwashed and screened		1.75
Cheshire, Mass.—Furnace lining, molding fine and coarse		5.00
Sand blast	5.00@	8.00
Stone sawing		6.00
Columbus, Ohio:		
Core	.30@	1.50
Traction	.30@	.90
Molding coarse	1.25@	1.50
Furnace lining	1.75@	2.00
Stone sawing		1.50
Brass molding	2.00@	2.25
Sand blast	3.50@	4.50
Eau Claire, Wis.:		
Sand blast		3.00
Traction		.65
Elco, Ill.:		
Ground silica per ton in carloads	22.00@	31.00
Elnora, N. Y.:		
Brass molding	1.75@	2.00
Estill Springs and Sewanee, Tenn:		
Molding fine and core		1.25
Roofing sand, sand blast, traction	1.35@	1.50
Franklin, Penn.:		
Furnace lining, molding fine and coarse		1.75
Core		2.00
Gray Summit and Klondike, Mo.:		
Stone sawing		1.00
Core, furnace lining, molding fine, roofing sand		1.75
Brass molding	1.75@	2.00
Sand blast		2.00
Joliet, Ill.:		
No. 2 molding sand; also loam for luting purposes and open-hearth work	.65@	.85
Kasota, Minn.:		
Stone sawing		1.00
Mapleton Depot, Penn.:		
Molding fine, traction		2.00
Roofing sand		1.50
Massillon, Ohio:		
Molding fine, coarse, furnace lining core and traction		2.50
Michigan City, Ind.:		
Core, in open car, .30; in box car		.40
Mineral Ridge and Ohlton, Ohio:		
Molding fine and coarse, traction, furnace lining, all green		1.60
Core, roofing sand, sand blast, all green		1.75
Montoursville, Penn.:		
Traction		1.10
Core	1.35@	1.50
New Lexington, Ohio:		
Molding fine		2.00
Molding coarse		1.50
Oceanside, Calif.:		
Roofing sand		3.50
Ottawa, Ill.:		
Molding coarse (crude silica sand)	.75@	.90
Sand blast		3.50
Stone sawing		1.50
Red Wing, Minn.:		
Core, furnace lining, stone sawing		1.50
Molding fine and coarse, traction		1.25
Sand blast		3.50
Filter sand		3.75
Ridgway, Penn.:		
Furnace lining, molding fine and coarse		1.50
Core		1.90
Round Top, Md.:		
Core		1.60
Traction		1.75
Roofing sand		2.25
St. Louis, Mo.:		
Core	1.00@	1.75
Furnace lining		1.50
Molding fine	1.50@	2.50

Crushed Slag

City or shipping point	¼ in.	½ in.	¾ in.	1½ in.	2½ in.	3 in.
EASTERN:	Roofing	down	and less	and less	and less	and larger
Buffalo, N. Y.	2.35@2.50	1.35@1.70	1.45@1.80	1.35@1.70	1.35@1.70	1.35@1.70	1.35@1.70
Eastern Penn. and Northern N. J.	2.50	1.20	1.50	1.20	1.20	1.20	1.20
Emporium and Dubois, Penn.	2.35@2.50	1.35@1.70	1.45@1.80	1.35@1.70	1.35@1.70	1.35@1.70	1.35@1.70
Reading, Pa.	2.50	1.00	.....	1.25	.....	.....	.....
Western Penn.	2.50	1.25	1.50	1.25	1.25	1.25	1.25
CENTRAL:							
Ironton, Ohio	2.05	1.45	.....	1.45	.....	1.45†	1.45‡
Jackson, Ohio	.....	1.05	.....	1.30	1.05	.....	1.30‡
Toledo, Ohio	1.50	1.25	1.25	1.25	1.25	1.25	1.25
Youngst'n, O., dist.	2.00	1.25	1.35	1.35	1.25	1.25	1.25
SOUTHERN:							
Ashland, Ky.	.....	1.55	.....	1.55	1.55	.....	1.55‡
Ensley and Alabama City, Ala.	2.05	.80	1.25	1.15	.90	.90	.80
Longdale, Roanoke, Ruesens, Va.	2.50	1.00	1.25	1.25	1.25	1.15	1.15

*¼ in. to 1½ in. †¼ in. to 2 in. ‡1½ in. to 3 in.

Lime Products (Carload Prices Per Ton F.O.B. Shipping Point)

	Finishing	Masons'	Agricultural	Chemical	Ground burnt lime,		Lump lime,	
EASTERN:	hydrate	hydrate	hydrate	hydrate	Blk.	Bags	Blk.	Bbl.
Berkeley, R. I.	.....	.....	12.00	.....	.....	.....	.....	2.20
Buffalo, N. Y.	.....	12.00	12.00	12.00	.....	.....	.....	.....
Lime Ridge, Penn.	.....	.....	.....	.....	.....	.....	5.00a	.....
West Stockbridge, Mass.	.....	10.50	5.60	.....	.....	.....	.....	2.25m
Williamsport, Penn.	.....	.....	10.00	.....	.....	.....	6.00	.....
York, Penn.	.....	10.50	10.50	11.50	.....	.....	8.50	1.65i
CENTRAL:								
Cold Springs, Ohio (f)	12.50	10.00	10.00	.....	9.00	11.00	9.00	.....
Delaware, Ohio	12.50	10.00	9.00	10.50	9.50	1.35	9.00	1.50
Gibsonburg, Ohio (f)	12.50	10.00	10.00	.....	9.00	11.00	9.00	.....
Huntington, Ind.	12.50@14.50	10.00	9.00	.....	9.00	11.00	9.00	.....
Luckey, Ohio (f)	12.50	.....	.....	.....	.....	.....	.....	.....
Marblehead, Ohio	12.50	10.00	9.00	12.00	9.00	11.00	9.00	1.50c
Marion, Ohio	.....	10.00	9.00	.....	.....	.....	9.00	1.70
Sheboygan, Wis.	.....	.....	.....	.....	.....	.....	8.50t	.....
Tiffin, Ohio	.....	.....	.....	.....	9.00	.....	.....	.....
White Rock, Ohio	12.50	.....	.....	.....	.....	.....	.....	.....
Woodville, Ohio (f)	12.50	10.00	9.00	.....	9.00	10.50l	9.00	1.50
SOUTHERN:								
El Paso, Texas	.....	.....	.....	.....	.....	.....	10.00	1.75
Graystone, Ala.	12.50	11.00	.....	10.00	.....	1.35u	8.50	1.50
Karo, Va.	.....	10.00	9.00	.....	.....	.....	7.00g	1.65h
Knoxville, Tenn.	20.50	11.00	.....	.....	.....	1.35	8.00	1.50
Varnons, Ala. (f)	.....	10.00p	10.00p	.....	.....	.....	8.00q	1.40r
Zuber and Ocala, Fla.	13.00	11.00	10.00	.....	12.00	.....	.....	1.75
WESTERN:								
Kirtland, N. M.	.....	.....	.....	.....	.....	.....	15.00	.....
San Francisco, Calif.	20.00†	20.00†	15.00s	20.00†	.....	.....	.....	2.50o

†50-lb. paper bags, burlap 24.00; (a) run of kilns; (c) wooden, steel 1.70; (d) wood; (e) per 180-lb. barrel; (f) dealers' prices; (g) to 9.50; (h) to 1.75; (i) 180-lb. bbl.; 2.65, 280-lb. bbl.; (l) 80-lb. paper; (m) finishing lime, 3.00 common; (n) common lime; (o) high calcium; (p) to 11.00; (q) to 8.50; (r) to 1.50; (s) in 80-lb. burlap sacks; (t) in bbls.; (u) two 90-lb. bags.

Miscellaneous Sands

(Continued)

Molding coarse	1.25@	1.75
Roofing sand		1.75
Sand blast	3.50@	4.50
Stone sawing	1.25@	2.25
Traction		1.25
Brass molding	2.00@	3.00
San Francisco, Calif:		
(Washed and dried) — Core, sand blast and brass molding	3.50@	5.00
Furnace lining and roofing sand	3 50@	4.50
Molding fine and traction		3.50
Molding coarse		4.50
(Direct from pit)—Core and molding fine	2.50@	4.50
Sewanee, Tenn.:		
Molding fine and coarse, roofing sand, sand blast, stone sawing, traction, brass molding		1.25
Skerkston, Ont.:		
Traction (lake sand)		.65
Tamms, Ill.:		
Ground silica per ton in carloads	20.00@	31.00
Thayers, Penn.:		
Core		2.00
Molding fine and coarse		1.25
Traction		2.25
Utica, Ill.:		
Core, furnace lining, molding fine (crude and dry)	.60@	1.00
Molding coarse (crude and dry)	.60@	1.25
Traction, roofing sand		1.00
Brass molding	1.00@	1.25
Stone sawing	1.00@	2.75
Sand blast		2.75
Utica, Penn.:		
Core		2.00
Molding fine and coarse		1.75
Warwick, Ohio.:		
Core, molding fine and coarse (green)		1.75
Core, molding fine (dry)		2.25
Zanesville, Ohio:		
Molding coarse		1.50
Core, furnace lining, molding fine, brass molding		2.00
Traction		2.50
Molding coarse	1.40@	1.50
Molding fine, brass molding	1.50@	1.75

Talc

Prices given are per ton f.o.b. (in carload lots only), producing plant, or nearest shipping point.

Baltimore, Md.:		
Crude talc (mine run)	3.00@	4.00
Ground talc (20-50 mesh), bags		10.00
Cubes		55.00
Blanks (per lb.)		.08
Pencils and steel workers' crayons, per gross		1.25
Chatsworth, Ga.:		
Crude (for grinding)		5.00
Ground talc (150-200 mesh), bags		10.00
Pencils and steel workers' crayons, per gross		1.50
Chester, Vt.:		
Ground talc (150-200 mesh), bulk	9.00@	10.50
Bags	10.50@	11.50
Chicago, Ill.:		
Ground (150-200 mesh) bags		30.00
Emeryville, N. Y.:		
(Double air floated) including bags;		
325 mesh		14.75
200 mesh		13.75
Hailesboro, N. Y.:		
Ground (150-200 mesh) bags		18.00
Ground (200-300 mesh) bags		20.00
Henry, Va.:		
Crude talc (mine run)		3.50
Ground talc (150-200 mesh), bags	9.00@	14.50
Keeler, Calif.:		
Ground (200-300 mesh), bags	20.00@	30.00
Marshall, N. C.:		
Crude	4.00@	8.00
Ground (20-50 mesh), bags extra	6.50@	8.50
Ground (150-200 mesh), bags	8.00@	12.00
Natural Bridge, N. Y.:		
Ground talc (300-325 mesh), bags		13.00

Rock Phosphate

Prices given are per ton (2240-lb.) f.o.b. producing plant or nearest shipping point.

Lump Rock

Gordonsburg, Tenn.—B.P.L. 65-72%	4.25@	5.00
Mt. Pleasant, Tenn.—B.P.L. 72%	5.50@	6.00
B.P.L. 75%	6.00@	6.50
B.P.L. 75% (free of fines for furnace use)	6.50@	6.75
Tennessee—F. O. B. mines, gross ton, unground Tenn. brown rock, 72% min. B.P.L.		5.50
Twomey, Tenn.—B.P.L. 65%, 2000 lb.	7.00@	8.00

(Continued on next page)

Roofing Slate

The following prices are per square (100 sq. ft.) for Pennsylvania Blue-Gray Roofing Slate, f. o. b. cars quarries:

Sizes	Genuine Bangor, Washington Big Bed, Franklin Big Bed	Genuine Albion	Slatington Small Bed	Genuine Bangor Ribbon
24x12, 24x14	10.20	10.00	8.10	7.80
22x12	10.80	10.00	8.40	8.75
22x11	10.8ℓ	10.50	8.40	8.75
20x12	12.60	10.50	8.70	8.75
20x10, 18x10, 18x9, 18x12	12.60	11.00	8.70	8.75
16x10. 16x9, 16x8, 16x12	12.60	11.00	8.40	8.75
14x10	11.10	11.00	8.10	7.80
14x8	11.10	10.50	8.10	7.80
14x7 to 12x6	9.30	10.50	7.50	7.80
	Mediums	Mediums	Mediums	Mediums
24x12	$ 8.10	$8.10	$7.20	$5.75
22x11	8.40	8.40	7.50	5.75
Other sizes	8.70	8.70	7.80	5.75

For less than carload lots of 20 squares or under, 10% additional charge will be made.

(Continued from preceding page)

Ground Rock
(2000 lb.)

Gordonsburg, Tenn.—B.P.L. 68-72%..	4.00@ 5.00
Mt. Pleasant, Tenn.—B.P.L. 65%.....	7.00
13% phosphorus, 95% thru 80 mesh	5.75
Twomey, Tenn.—B.P.L., 65%.....	7.00@ 8.00

Florida Phosphate
(Raw Land Pebble)
Per Ton

Florida—F. O. B. mines, gross ton, 68/66% B.P.L., Basis 68%.....	2.50
70% min, B.P.L., Basis 70%.....	2.75
72% min. B.P.L., Basis 72%.....	3.00
75/74% B.P.L., Basis 75%.....	4.00

Fluorspar

Fluorspar, 85% and over calcium fluoride, not over 5% silica, per net ton, f.o.b. Illinois and Kentucky mines	18.50
Fluorspar, foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Philadelphia, duty paid, per net ton	18.00
Fluorspar, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, per net ton, f.o.b. Illinois and Kentucky mines.....	32.50

Special Aggregates

Prices are per ton f. o. b. quarry or nearest shipping point.

City or shipping point	Terrazzo	Stucco chips
Barton, Wis., f.o.b. cars	.....	10.50
Brandon, Vt.‡—English cream	9.00	9.00
English pink	9.00	9.00
Chicago, Ill.—Stucco chips, in sacks f.o.b. quarries	.....	17.50
Crown Point, N. Y.—Mica Spar	.....	8.00@10.00
Easton, Penn., and Phillipsburg, N. J.—Green	.....	5.00@ 7.00
Haddam, Conn. — Felstone buff	15.00	15.00
Harrisonburg, Va.—Blk marble (crushed, in bags	†12.50	†12.50
Ingomar, Ohio (in bags)	.....	5.00@20.00
Middlebrook, Mo.—Red	.....	20.00@25.00
Middlebury, Vt.‡—Middlebury white	9.00	9.00
Milwaukee, Wis.	.....	14.00@34.00
Newark, N. J.—Roofing granules	.....	7.50
New York, N. Y.—Red and yellow Verona	.....	32.00
Red Granite, Wis.	.....	7.50
Sioux Falls, S. D.	7.50	7.50
Stockton, Cal. — "Natrock" roofing grits	.....	12.00
Tuckahoe, N. Y.	.....	12.00
Villa Grove, Colo.	.....	13.00
Wauwatosa, Wis.	.....	16.00@45.00
Wellsville, Colo.—Colorado Travertine Stone	15.00	15.00

†C.L. Less than C. L., 15.50.
‡C.L. lots, for L.C.L. add 3.50 per ton. Add 2.00 per ton for bags.

Concrete Brick

Prices given per 1000 brick, f.o.b. plant or nearest shipping point.

	Common	Face
Appleton, Minn.	22.00	25.00@35.00
Baltimore, Md. (Del. according to quantity)	16.00@16.50	22.00@50.00
Ensley, Ala. ("Slagtex")	12.50	22.50@33.50
Eugene, Ore.	25.00	35.00@75.00
Friesland, Wis.	22.00	32.00
Milwaukee, Wis.	14.00	30.00@42.00
Omaha, Neb.	18.00	30.00@40.00
Philadelphia, Penn.	15.25	21.50
Portland, Ore.	19.00	25.00@55.00
Prairie du Chien, Wis.	14.00	25.00@32.00
Rapid City, S. D.	18.00	25.00@45.00
Watertown, N. Y.	18.00@21.00	35.00@37.50
Wauwatosa, Wis.	14.00	20.00@42.00
Winnipeg, Man.	14.00	22.00

Sand-Lime Brick

Prices given per 1000 brick f. o. b. plant or nearest shipping point, unless otherwise noted.

Barton, Wis.	10.50
Boston, Mass.	14.00@15.50
Brighton, N. Y.	16.75
Dayton, Ohio	12.50@13.50
Farmington, Conn.	14.00
Grand Rapids, Mich.	12.00
Hartford, Conn.	14.00
Jackson, Mich.	13.00
Lancaster, N. Y.	13.00
Michigan City, Ind.	12.00
Milwaukee. Wis.	13.00
Portage, Wis.	15.00
Rochester, N. Y. (del. on job)	19.75
Saginaw, Mich.	13.00
San Antonio, Texas	13.00@13.50
Syracuse, N. Y.	*20.00
Terra Cotta, D. C.	13.50
Wilkinson, Fla.—White	13.00
Buff	17.00

*Mill price, $22.00 delivered.

Gray Klinker Brick

El Paso, Texas	13.00

Lime

Warehouse prices, carload lots at principal cities.

	Hydrated, Finishing	per ton Common
Atlanta, Ga.	22.50	14.00
Baltimore, Md.	24.25	17.85
Boston, Mass.	20.00	14.00@15.00
Cincinnati, Ohio	16.80	14.30
Chicago, Ill.	20.00	18.00
Dallas, Tex.	20.00	.....
Denver, Colo.	24.00	.....
Detroit, Mich.	15.50	15.50
Kansas City, Mo.	19.50	18.50
Los Angeles, Calif.	.....	18.00
Minneapolis, Minn. (white)..	25.50	21.00
Montreal, Que.	.....	21.00
New Orleans, La.	24.00	16.00
New York, N. Y.	18.20	12.00@13.10
Philadelphia, Penn.	23.00	16.00
St. Louis, Mo.	23.00	19.00
San Francisco, Calif.	.....	22.00
Seattle, Wash. (paper sacks)..	24.00	——

Portland Cement

Prices per bag and per bbl. without bags net in carload lots.

	Per Bag	Per Bbl.
Boston, Mass.	.....	2.63
Buffalo, N. Y.	.....	2.48
Cedar Rapids, Iowa	.....	2.44
Cincinnati, Ohio	.....	2.47
Cleveland, Ohio	.....	2.39
Chicago, Ill.	.....	2.20
Columbus, Ohio	.....	2.44
Dallas, Texas	.53¾	2.15
Davenport, Iowa	.....	2.39
Dayton, Ohio	.....	2.48
Denver, Colo.	.63¼	2.55
Detroit, Mich.	.....	2.25@2.35
Duluth, Minn.	.....	2.19
Indianapolis, Ind.	.....	2.41
Kansas City, Mo.	54¼	2.17
Los Angeles, Cal. (less 5c dis.)	.60	2.60
Louisville, Ky.	.....	2.45
Memphis, Tenn.	.65	2.60
Milwaukee, Wis.	.....	2.25@2.35
Minneapolis, Minn.	.60½	2.42
Montreal, Que.	.....	1.90
New York, N. Y.	.....	2.25
Omaha, Neb.	.62¾	2.51
Philadelphia, Penn.	.....	2.41
Pittsburgh, Penn.	.....	2.19
San Francisco, Calif.	.65¼	2.31
St. Louis, Mo.	.57½	2.30
St. Paul, Minn.	.....	2.42
Seattle, Wash. (10c bbl. dis.)..	.....	2.65
Toledo, Ohio	.....	2.40

NOTE—Add 40c per bbl. for bags.

Mill prices f.o.b. in carload lots, without bags, to contractors.

	Per Bag	Per Bbl.
Buffington. Ind.	.....	1.95
Concrete, Wash.	.....	2.35
Dallas, Texas	.52½	2.50*
Davenport, Calif.	.....	2.05
Hannibal, Mo.	.....	2.05
Hudson, N. Y.	.....	2.05
Leeds, Ala.	.....	1.95
Mildred, Kan.	.....	1.95
Nazareth, Penn.	.....	1.95
Northampton, Penn.	.....	1.95

*Including sacks at 10c each.

Cement Products

Hawthorne tile, carload lots, f.o.b. Cicero, Ill.

	Per sq.
Silver gray	9.50
Red French	11.50
Green French	12.00
Red Spanish	12.00
Green Spanish	12.00

	—Cicero— Red	Green
Ridges	.25	.35
Hips	.20	.30
Ridge closers	.05	.06
Hip terminals, 3 way	1.25	1.50
Hip starters	.50	.60
Gable finials	1.25	1.50
Gable starters	.20	.30
End bands	.20	.30
Eave closers	.06	.08

Gypsum Products—CARLOAD PRICES PER TON AND PER M SQUARE FEET, F. O. B. MILL

	Crushed Rock	Ground Gypsum	Agricultural Gypsum	Stucco Calcined Gypsum	Cement and Gauging Plaster	Wood Fiber	White Gauging	Sanded Plaster	Keene's Cement	Trowel Finish	—Plaster Board— ¼x32x 36". Wt. 1500 lb. Per M Sq. Ft.	⅜x32x 36". Wt. 1850 lb. Per M Sq. Ft.	Wallboard, ½x32 or 48". Lgths. 6'-10', 1850 lb. Per M Sq. Ft.
Centerville, Iowa	3.00	9.00	12.00	8.00	8.00	8.60	11.00	.....	25.80	9.00	.....	.....	.....
Douglas, Ariz.	.....	.....	7.00	.....	16.5ℓ	.....	19.50	.....	.....	15.50	.....	.....	.....
Grand Rapids, Mich.	2.75	6.00	6.00	8.00	9.00	9.00	17.50	.....	26.55	20.00	.....	.....	.....
Gypsum, Ohio‡	3.00	4.00	6.00	9.00	9.00	9.00	18.00	7.00	30.15	20.00	.....	20.00	30.00
Hanover, Mont.	.....	.....	.....	11.80	.....	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles, Calif.	.....	.....	.....	10.90b	.....	.....	12.30	.....	.....	.....	.....	.....	.....
Port Clinton, Ohio	3.00	4.00	6.00	10.00	9.00	9.00	21.00	7.00	30.15	20.00	.....	20.00	30.00
Portland, Colo.	.....	.....	.....	10.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Francisco, Calif.	.....	.....	.....	.....	16.40	.....	17.40	.....	.....	.....	.....	.....	.....
Sigurd, Utah	.....	.....	.....	.....	.....	.....	.....	.....	18.00a	.....	.....	.....	.....
Winnipeg, Man.	5.50	5.50	7.00	13.50	15.00	15.00	.....	.....	.....	.....	28.50	.....	34.00

NOTE—Returnable bags, 10c each; paper bags, 1.00 per ton extra (not returnable).
*To 3.00; †to 11.00; ‖to 12.00; ‡prices per net ton, sacks extra; (a) to 21.00; (b) sacks, 12c each.

New Machinery and Equipment

New Half-Yard Excavator with Crawler Tread

THE list of excavators has recently been enlarged by the development of a new ½-yd. full revolving, gasoline or electric, machine mounted on caterpillar treads.

This new machine, which is known as Model 204, is designed and built by the Harnischfeger Corporation, Milwaukee, Wis., and resembles the other P&H models in that it involves the same general principles of construction and operation as the other machines made by this company. The makers describe it as follows:

New 1/2-yd. gas or electric driven shovel which is of the full revolving type and mounted on crawler treads

"The power is supplied by a single gasoline motor, of the heavy duty, tractor type, developing 40 hp. at 960 r.p.m. Power is transmitted through cut steel gears with the minimum number of reductions. The two main drums are independently mounted on separate shafts and are controlled by outside band clutches and brakes, the clutches being operated by power clutch control. The drums have a standard line speed of 110 ft. per min., but may be lagged to give higher speeds for certain work. Both the revolving frame and car body frame are of cast steel in one piece. All shafts are turned and ground to micrometer size and all bearings are provided with Alemite or pressure cup lubrication. The traction frames are heavy steel castings, which receive the weight of the machine from two heavy forged axles. The treads are non-cloggable and the tread rollers are swiveled in two directions to adjust to any irregularities of the ground. All gears are well guarded to protect the operator and the first reduction and travel gears are fully enclosed, running in oil. There are two travel speeds—11/16 and 1⅜ m.p.h.—forward and reverse. All steering is controlled from the operator's platform by use of a simple hand wheel. The main machinery and operator's platform are fully enclosed in an all-steel cab, provided with suitable doors and windows for care and operation.

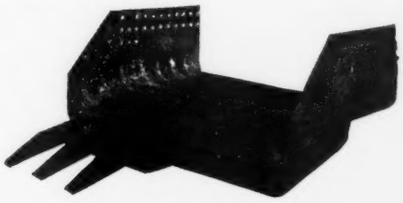
"This machine handles a ½-yd. dragline or clamshell bucket on a 30-ft. boom and has a rated lifting capacity of 13,000 lb. at 10 ft. radius, which is 75% of its tipping capacity. The shovel is ½ yd. capacity and of the standard P&H design, with an all-steel, box section boom, outside dipper sticks and a crowding motion which enables the operator to have full control of the dipper at all points, acting independently from the hoisting motion."

A Bridge Type Dipper with Special Arrangement for Holding Teeth

THE Clark bridge type dipper which is made by the American Manganese Steel Co. has a double walled bottom with connecting ribs which form supports for the teeth. The ribs are arranged so that the front may be equipped with the number of teeth best adapted to the digging conditions. Thus the 2½-yd. dipper front which has nine sockets may use either 3, 4, 5 or 9 teeth, depending on the material to be dug.

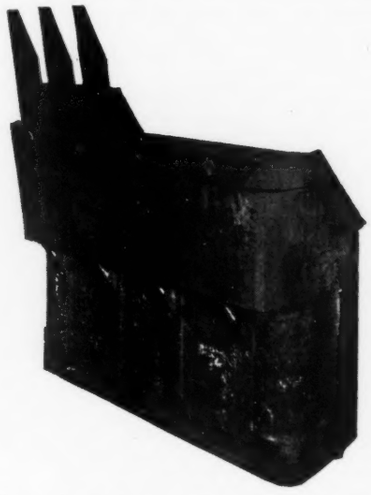
With this construction digging teeth made of square tool steel bars and pick up teeth of manganese steel may be used in combination. On the outside of the cutting edge under the teeth is a small renewable wearing plate.

The digging teeth of tool steel may be quickly removed and resharpened and as they are worn down they may be brought forward by placing a block in the bottom of the socket, to hold them to the digging length.



Any number of teeth may be used and combinations of tool steel and manganese steel teeth

The manufacturers say that: "the front is made perfectly flat and has the ability of making a smooth even cut which is so desirable in stripping or digging with power shovels. This flat bottom is so reinforced that buckling is impossible, and the digging edge is very strong, due to having an integral inside and outside wall joined together by numerous braces forming, as the name implies, the bridge type front."



Bottom of dipper showing the braced construction

In addition, the advantages of the design the makers point out that the front is made of Amsco manganese steel, which has proved itself in sturdiness and durability in many digging operations.

Cleaning the Air for Compressors and Engines

THE importance of clean air for air compressors and internal combustion engines has not yet been fully realized by the users of these machines. Many times it happens that blame which is given to faulty lubrication or poor fuel should really be placed to the account of dirty air. If one stops to think about it, the effect of grit, sand and dirt entering the cylinders of a high speed machine of either type must account for a very large percentage of the wear and heating that such machines show after a considerable period of service. The wonder is that the effect of wear from such causes is not more marked than it is.

A portable air compressor set in which both engine and air compressor are provided with filters to cleanse the air

The filter as applied to large units such as air compressors

In a properly lubricated cylinder, either of an air compressor or an internal combustion engine, the cylinder wall and the piston are always separated by a film of oil. The wear is on the oil and not on the metal surfaces. But if dust and grit are present, wear, and even cutting of one or both surfaces, must result. Dirt and grit are kept out of the oil and the fuel (in the case of an engine) by filters in almost every case. The importance of such filters has long been recognized. But the matter of filtering the air has yet to be appreciated as much as it should be.

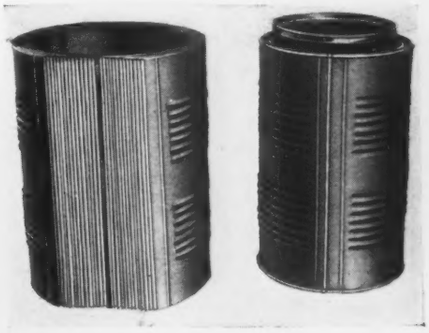
The Staynew Filter Corp., Rochester, N. Y., makes an air filter called the Protectomotor which has many points of merit. The filter is a frame of galvanoid steel wire which supports a one-piece covering of specially prepared felt. For an internal combustion engine, this filter has 200 times the opening of the carburetor intake in filtering area so that the air is reduced to 1/200 of the velocity with which it enters the intake. The reduction of velocity allows most of the sand, grit, etc., to be separated by gravity. Whatever adheres to the filter adheres so lightly that it is readily shaken off by the vibration of the engine and falls through an opening in the bottom of the shell. This makes the filter an effective self-cleaning device, according to the makers, who say that it has been thoroughly tested by four years of use on hundreds of motors and compressors.

The Protectomotor is made in a number of models and sizes.

Drums for Shipping Lime, Cement and Similar Products

THE "Hammerall" drums for shipping lime, cement and similar products are made by the Pittsburgh Steel Drum Co., Pittsburgh, Penn. According to the manufacturers, these drums are made of a special analysis sheet steel; the side is fastened by a four-ply Acme lock seam which is strengthened by a reinforcing corrugation and the heads are fastened by a process patented by the makers which prevents them being torn from the body. Different types are supplied in the various sizes, according to the needs of the product which is to be shipped.

The drums are shipped unassembled, to be put together by the purchaser. The makers of the drum say that one man can assemble from 75 to 125 drums per day, according to the gage of the steel, and that the cost of assembling equipment is about $500.



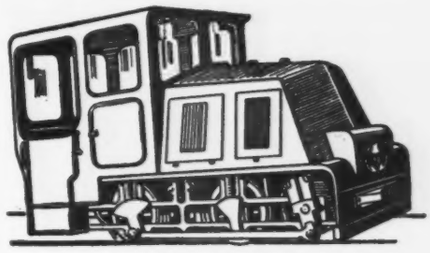
Drums nested for shipment and one set up

Unassembled drums are shipped to the user at fifth and sixth class freight rate, according to the district, 2000 to 6000 to a car, according to the gage of steel. The standard sizes are:

18.25	x24.5	in.	inside measure	28 gallons
18.25	x27.5	in.	inside measure	30 gallons
20	x22.5	in.	inside measure	30 gallons
20	x30	in.	inside measure	40 gallons
22	x31	in.	inside measure	50 gallons
22	x33	in.	inside measure	54 gallons

Diesel Locomotive for Quarries Introduced in France

THE Diesel engine as a power plant for locomotives has been the subject of considerable experimenting in Europe for the past two or three years. Its application for general railway use has been tried with some success in England and in Sweden.



A French quarry locomotive with Diesel power

Recently a small locomotive for quarry and general contractors' use has been placed on the market in France.

Details of construction are not given. The cut is from an advertisement of the makers, Societe d' Applications des Moteurs a Huile, Loudre, 37 Rue de General Foy, Paris.

The consumption of fuel is given at "½ Centime de Mazout" for the metric ton.

Gilmore Cement Refuses Offer to Buy Plant

MORE than a hundred stockholders of the Gilmore Portland Cement Co., Gilmore City, Iowa, met recently at Fort Dodge to act on a proposal to sell the plant. A tentative offer had been made through E. J. Dalton of Chicago for the purchase of the company, the offer being to buy the stock considerably below par and to give in payment second mortgage bonds on the plant, running from six to 12 years.

Among the smaller stockholders there was strenuous opposition to the sale, the feeling being expressed that a better deal could be made, or that the company could be refinanced and put on a paying basis.

A. C. Brown of Estherville, president of the company, presided at the meeting. B. F. Carroll, former state governor and a member of the board of directors, was present. The plant was completed in 1919, and the outstanding stock of the company was given as $1,111,200.—*Des Moines (Iowa) Register.*

Missouri Valley Sand and Gravel Producers' Semi-Annual Meeting

THE Missouri Valley Sand and Gravel Producers' Association held its semi-annual meeting in Topeka on May 25. The regular meeting of the executive committee of the association was combined with this.

A considerable proportion of the meeting was taken up in the discussion of workingmen's compensation insurance. A second questionnaire which had been sent to members not having been fully returned, the data for a report was not complete. Frank W. Peck was of the opinion that if some old-line company could be assured the business of all the members of the association the rates would be reduced very materially. It was ordered that the Kansas City producers and the secretary be constituted a committee to try to get quotations from a number of old-line companies on this business.

Progress was reported in the tests which are being made for the association by E. C. L. Wagner comparing natural river sand and crushed flint as fine aggregates for concrete. As soon as the report should be ready for publication, the secretary was instructed to have 2000 copies prepared for distribution by the members.

Resolutions were passed expressing the sympathy of the members with A. E. Fisher of Glasgow, Mo., who recently lost his son, Robert.

It was decided that the next annual meeting would be held in Kansas City, December 16 and 17, 1925.

There were the usual social features, the ladies who accompanied the members being entertained by an auto trip in the afternoon. A dancing party and supper followed in the evening.

The following were in attendance:

H. H. Allison, Manhattan Sand Co., Salina, Kas.; J. H. Boss, Producers Sand Co., Tulsa, Okla.; C. C. Busey, Southwestern Coal and Sand Co., Topeka, Kas.; John I. Carroll, American Sand Co., Kansas City, Mo.; J. I. Cowell, Reid and Wheelock, Clay Center, Kas.; R. H. Cubbon, Jackson-Walker Coal and Mining Co., Wichita, Kas.; Danel L. Denise, Topeka Sand Co., Topeka, Kas.; N. C. Dunn, Arkansas City Sand Co., Arkansas City, Kas.; F. H. Gades, Wear Sand Co., Topeka, Kas.; W. E. Johnson, Missouri Valley Association of Sand and Gravel Producers, Kansas City, Mo.; E. L. Kirkham, Stewart Sand Co., Kansas City, Mo.; O. W. Knight, River Sand Co., Topeka, Kas.; Otto Kuehne, Jr., Kansas Sand Co., Topeka, Kas.; F. A. Laughead, Topeka Sand Co., Topeka, Kas.; L. E. Leach, Muncie Sand Co., Kansas City, Mo.; A. N. McQuown, Empire Sand and Material Co., Wichita, Kas.; Frank W. Peck, Muncie Sand Co., Kansas City, Mo.; W. E. Rogers, Arkansas River Sand Co., Tulsa, Okla.; W. E. Seright, Empire Sand and Material Co., Wichita, Kas.; R. J. Stewart, Pioneer Sand Co., St. Joseph, Mo.; W. J. Stewart, Stewart Sand Co., Kansas City, Mo.; H. B. Thompson, American Sand Co., Kansas City, Mo.; T. G. Wear, Wear Sand Co., Topeka, Kas.

Florida Company Building Cement Plant and Enlarging Crushing Plant

CONSTRUCTION of the first unit of a cement plant which will cost $1,500,000 is now under way at the plant of the Florida Rock Products Co. at Brooksville, Fla., according to a statement in the Tampa, Fla., *Tribune* based on an announcement by W. L. Porter, president of the company. This construction represents one feature in the company's plans for enlarging.

Three new crushers are to be installed in its crushing plant and a washing plant erected. The primary crusher will have a capacity of 700 tons an hour and the plant a working capacity of 5000 tons daily, it is said. A contract has been let for the sinking of an 18-in. well to supply water for washing.

The company will also move the Blowers pulverized limestone plant, which now operates at Ocala, Fla., to Brooksville. An amiesite plant will also be constructed.

Improvements on the crushing plant estimated to cost $400,000 will be completed in a few weeks, the other construction plans will, of course, require several months for execution.

Installing New Kiln at Signal Mountain Cement Plant

MACHINERY for a new unit to the Signal Mountain Portland Cement Co.'s plant at Chattanooga, Tenn., and a large kiln has been received and will be installed immediately, according to announcement of Maj. H. J. Weeks, superintendent of the plant. The new machinery will be installed by July 1, and it is stated that this will increase the capacity of the plant 50%, giving it a total of 4500 bbl. daily. The improvement will cost approximately $250,000.

There is a possibility that the company may shortly proceed to carry out its plan of establishing a waste heat steam system at the plant.—*Nashville (Tenn.) Banner.*

France Stone Company to Open New Quarry

THE France Stone Co., Toledo, Ohio, has purchased a 75-acre tract of land in Seneca county, Ohio, adjacent to its present quarry and crushing plant southwest of Bellevue, and will soon start quarrying operations on it. The land is underlaid with deep deposits of limestone but a few feet beneath the surface.

Death of Major Charles H. Miller, Prominent Sand and Gravel Producer

MAJOR CHARLES H. MILLER, president and general manager of the Allen Gravel Co. of Memphis, Tenn., was drowned on May 8 when the steamer *Norman* capsized on the Mississippi river near Memphis with the party of engineers on board.

Major Miller was a member of the board of directors of the National Sand and Gravel Association and his company had been affiliated with the association for many years.

According to the *Engineering News-Record,* financial assistance to young men seeking engineering education as a memorial to Maj. C. H. Miller is proposed by the Little Rock (Ark.) Engineers' Club. Just before the boat turned over Major Miller was one of the engineers at the meeting of members of the American Society of Civil Engineers who made a plea for the extension of help to young men. Alfred M. Lund, who was on the boat, helped save many lives by working with Tom Lee, the negro boatman, in dragging people out of the river, is chairman of the committee having the matter in charge. A. C. Butterworth and R. E. Warden, survivors of the disaster, with Earle Hodges, D. W. Dickinson and N. B. Garber make up the committee. Mr. Warden states that Major Miller dragged him from the overturned boat in a semi-conscious condition and fastened a life preserver on him, thus saving his life. Subscriptions are expected from many of the local and national organizations in which Major Miller was prominent.

Quarry Accidents Statistics Bulletin

THE Bureau of Mines has issued bulletin No. 246 on quarry accidents in the United States during the year of 1923. Considerable interesting classified and summarized data on quarry accidents is given and a number of comparisons made. Until the limited free edition is exhausted, copies of this bulletin may be procured from the Bureau of Mines, after that they may be secured at 15 cents each from the Superintendent of Documents, Government Printing Office, Washington.

News of All the Industry

Incorporations

Sickler Quarries, Inc., Alford, Penn., $10,000; A. J. Masters of Kingston.

Grand Junction Sand and Gravel Co., Grand Junction, Colo., $9000; C. Rump and others.

Twin City Sand and Gravel Co., Cumberland, Md., by James C. Shriver and Eugene J. Kean.

Connecticut Lime Products, Inc., New Haven, Conn., 10,000; Booth C. Davis, Jr., and others.

Camp Concrete Rock Co., Ocala, Fla., $300,000; Jack Camp, president; E. F. Fitch, secretary.

Hard Rock Quarries, Inc., Denver, Colo., $75,000; W. L. and Gertrude J. Carey, J. B. Bertrand and others.

Standard Potash Co., Dallas, Texas, capital stock $10,000; J. N. Stier, T. C. Leachman and M. Gress.

San Gabriel Rock and Gravel Co., Los Angeles, Calif., changed name to Livingston Rock and Gravel Co.

Gypsum Construction Co., Cincinnati, Ohio, $5000; J. C. Lathrop, E. Clyde Hoge, M. Estep, C. B. Stubert and Morris J. Dale.

Cleves Concrete Products Co., Cleves, Ohio, by Walter V. and Edward J. Fox, Clarence Coleman, Noah D. Clark and Henry Moon.

Independent Sand Co., Inc., Kansas City, Mo., $5000; Charles S. Murray, Elin E. Murray, A. W. Gill, George H. Miller and C. H. Cotton.

Cinder Concrete Corporation, Rochester, N. Y., $100,000; E. B. Cadwell, F. J. Straub, S. Bo. (Attorneys, Carshan, Pierce and Block, Rochester.)

Brown Sand and Gravel Co., Chattanooga, Tenn. R. J. Brown, president. Will produce river sand and gravel. Equipment to cost about $50,000.

San Francisco Bay Terminals Co., Wilmington, Del., $1,800,000; quarries, asphalt and cement rock deposits. (Corporation Trust Co. of America.)

United Silica Sand Co., Wilmington, Del., $500,000; John T. Coonan, H. L. Jennings, M. B. Paxton, Buffalo, N. Y. (Capital Trust Co. of Delaware.)

Scioto Ville Sand and Gravel Co., Portsmouth, Ohio, $15,000; Gilbert S. Monroe, Charles I. King, H. O. Lindsey, George W. Watkins and F. C. Fuller.

Menno-Concrete Products Corporation, Queens, Long Island, N. Y., $10,000; B. J. Menton, A. Noblett . (Attorney, C. E. Sutherland, 15 Park Row, Manhattan.)

H. D. Bahr Sand and Gravel Corporation, Bronx, New York City, $25,000; H. D. and E. H. Bahr, F. C. Hirleman. (Attorneys, Hirleman and Vaughan, 391 East 49th street.)

Estill Springs Sand and Gravel Co., Chattanooga, Tenn. Has already purchased property and will erect a washing plant with a capacity of 30 cars a day; estimated cost $60,000.

Trenton Concrete Co., Trenton, N. J., $100,000; Aquilino Pernazza, Benjamin Volpe, Vincenzo Guerra, Trenton, and Albertino Volpe, Bristol, Penn. (Attorney, Daniel A. Spair, Trenton.)

Rockbestos Products Corporation, Boston, Mass., $600,000; 6000 preferred shares at $100 each, 10,000 common no par; C. F. Williams, president; Cecil E. Whitney, 60 State street, treasurer, and F. L. Auld.

A. J. Grover and A. B. Hicken, formerly operating gravel crushing business at Waukesha, Wis., have dissolved partnership, Mr. Hicken taking over all the business and obligations and A. J. Grover retiring.

Superior Sand and Gravel Co. has engaged in business on the corner of Whittier boulevard and San Gabriel river, Los Angeles, Calif. Members of the firm are: John D. Gregg, H. P. Buttress, 841 Los Tunas, San Gabriel; Jos. E. McClellan, 2021 Holly Hill terrace, Los Angeles.

Midway Sand and Gravel Co., Parkersburg, W. Va., $60,000; J. L. Williams, Lucretia H. Mallory, J. S. Echols, E. W. Mallory and T. Echols. Will develop gravel tracts and operate private railways for the conveyance of sand and gravel in Wood county, West Virginia. The chief works will be in Washington county, Ohio.

Cement

Signal Mountain Portland Cement Co., Chattanooga, Tenn., will establish a coke and byproduct plant, according to reports.

Superior Portland Cement Co., Seattle, Wash., has been appointed a distributor for Atlas Lumnite cement and will carry stocks of the cement at Seattle and Concrete, Wash.

Indiana Portland Cement Co., Indianapolis, Ind., is reported to have plans for a two-story building to be erected at Limedale, Ind., to cost $65,000 and serve in part as a testing laboratory.

Coast Cement Co., Vancouver, B. C., according to W. J. Budd, manager, will repair the damages caused by the fire at its plant, as noted in the May 30 issue of "Rock Products," and be ready to begin operations by July 1. The loss, estimated at $20,000, was covered by insurance.

Kosmos Portland Cement Co., Kosmosdale, Ky., reported to be steadily increasing shipments of cement to Cincinnati via steamers on the Ohio river. The company's steamer "Kosmos" recently passed through Louisville with a covered barge containing 600 tons of cement. The company has lately had a new steel barge constructed for this service.

Gulf States Portland Cement Co., Demopolis, Ala., has completed the installation of one new 8x125 ft. kiln and are now installing another along with additional grinding equipment. Within two months the company will discard the present power plant and use electricity furnished by Alabama Power Co. Plant will have a capacity of 2000 bbl. daily after these improvements.

Cement Products

William L. Dunn, Greensboro, N. C., has leased 190 acres of land and a building on West Lee street and will develop quarry and manufacture artificial marble.

Valley Concrete Pipe and Products Co., Yuba, Calif., has established a branch plant to manufacture concrete irrigation pipe at Butte City. It already has contracts for over 20,000 ft. of various size pipe there and has started production.

J. M. Bloodworth Co., Wauchula, Fla., is installing machinery and equipment in its new cement products plant. The plant will have an initial capacity of about 2500 concrete tile daily. Concrete shingles will also be made at the plant later, according to the plans of Mr. Bloodworth.

Universal Concrete Products Co., New Martinsville, W. Va., is establishing a branch plant at 32nd street and Woodland avenue, Louisville, Ky., to cost about $25,000. The plant will produce large reinforced concrete sewer pipe and specialties. H. Eschenbrenner is secretary-treasurer of the company.

American Hume Concrete Pipe Co., Detroit, Mich., a licensee of the Hume Pipe Co., Melbourne, Australia, has a plant under construction which will use the Hume centrifugal process of making reinforced concrete pipe. Sizes ranging from 4 in. to 8 ft. will be produced. Frank L. Klingensmith is president, with offices in the United States Savings Bank building.

Linthicum Stone Corporation, Baltimore, Md., recently incorporated with a capital of $1,000,000, has acquired the plant of the Stuart R. Carr Foundry Co. and will remodel it to produce artificial granites and marbles. The company has also secured the Beaver Dam Quarries at Cockeyville, Md. Frank H. Linthicum is president and general manager; H. A. Yerkes, vice-president and secretary-treasurer.

Art Stone Block Co., Inc., Johnstown, Penn., has begun the operation of its new $50,000 plant at Coopersdale. The plant has an initial capacity of 2000 concrete and "BO" cinder concrete blocks. William E. Barnhart is president and general manager and A. R. Fichtner, secretary-treasurer of the company. The general office is located at 118 F street. The company has plans to enlarge the capacity of the plant and to build an office building on the property at 149 Cooper avenue.

Sand and Gravel

Frank Van Hoosen has sold his interest in the Willamette Sand and Gravel Co., Corvallis, Ore., to Glen Averill.

Hillsboro Sand and Supply Co., Tampa, Fla., has purchased a bay frontage at Sarasota, Fla., and will erect a warehouse thereon.

Ray Hooton and G. C. Winslow of Greenfield, Ind., have purchased 10 acres of sand and gravel deposits on Brandywine Creek and are developing them.

Union Sand and Gravel Co., Huntington, W. Va., will put a new towboat, the "Daniel L. May," into service. The boat has been launched at the Howard shipyards, Jeffersonville, Ind., and will be completed and delivered soon.

George Schaaf has begun operations at his new sand and gravel plant at Griffith, Ind., producing gravel, plastering and torpedo sands. The gravel works along with a cement products plant represents an investment of over $40,000.

E. J. Goodpastor, president of the Santa Clara Gravel Co. of Santa Clara, Calif., has become associated with Ennis and Brown in the Enwood Sand and Rock Co., and will have the management of the business of that company. Harry W. Flint, who has been with the Ennis and Brown organization for the past 10 years, will continue as superintendent.

Texarkana Gravel Co., Texarkana, Texas, has taken over the plant of the Dixieland Motor Truck Co. and will operate it as a machine shop for equipment, repair and public service. During the war this plant was devoted to the manufacture of motor trucks, but because of business depression dropped that line of industry and specialized in machine repairs. Since then it has gone into the hands of a receiver. J. T. Sharp, head mechanic for the Texarkana Gravel Co., will be in charge of the shops and all necessary improvements will be made at once.

Quarries

F. Hartung and Son, Wauwatosa, Wis., had its crushing plant damaged by fire recently. The damage is estimated at $30,000.

T. C. Love and R. C. Huneycutt plan to develop a new limestone quarry at Stanfield, N. C., to produce crushed limestone for construction purposes.

Bethany Stone Co., Bethany, Mo., has put a new Osgood steam shovel into operation at its quarry west of the town. H. J. Rand is president of the company.

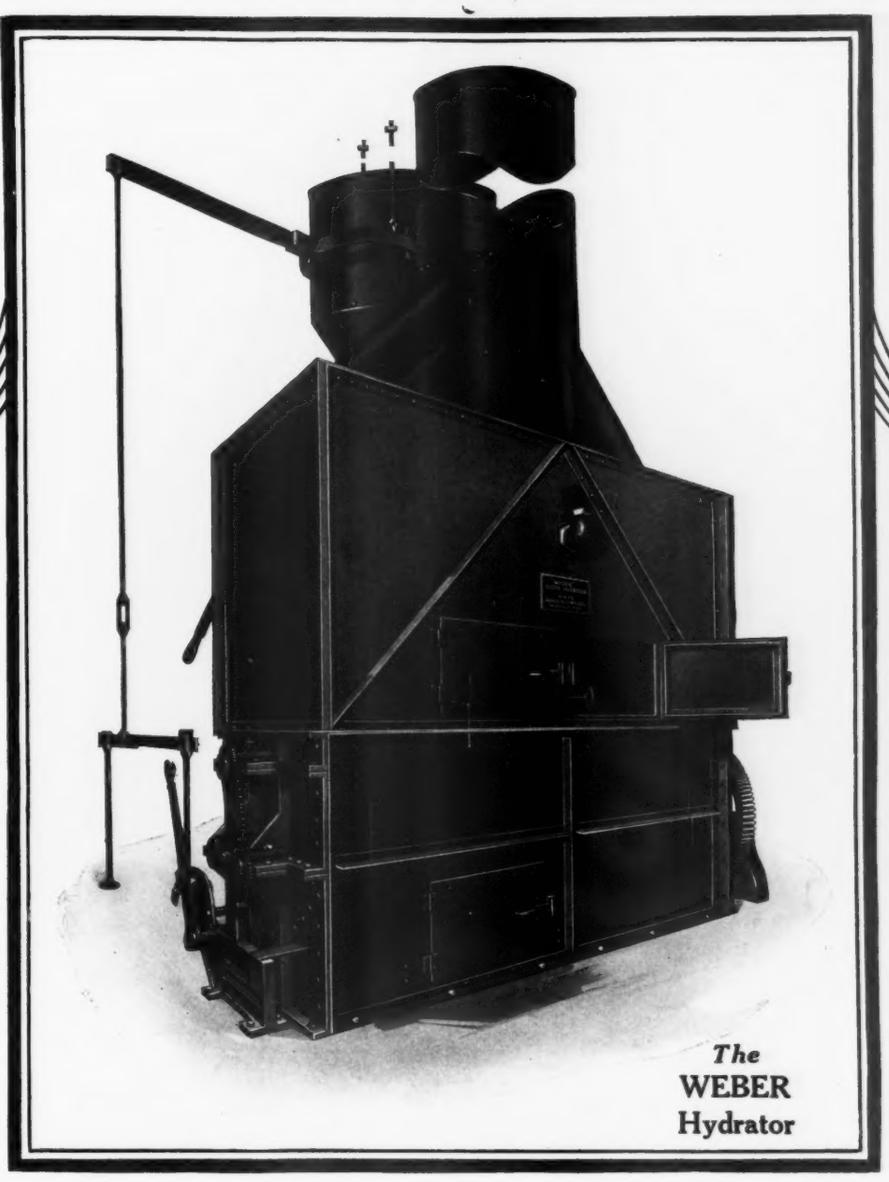
Bluff City Lime and Stone Co., Alton, Ill., has purchased a tract of 296 acres of land near Ste. Genevieve, Mo., on which it will mine limestone, by the tunnel process.

Stone Products Co., Indianapolis, Ind., had a fire at its crushed stone plant south of Logansport recently, causing a damage estimated at $22,000. Marshall Keen is plant superintendent.

Louisville (Ky.) workhouse quarry was opened recently. The property and equipment represent an investment of $35,000. Two crushers, one with a capacity of 60 tons an hour driven by a 75-hp. motor and the other with a capacity of 100 tons daily driven by a 40-hp. motor, have been installed and are now in operation.

Gypsum

Plastoid Products Co., Los Angeles, Calif., has completed a $20,000 improvement program at its plant at 25th and Downey road, increasing its output of gypsum centered plaster lath 50% and adding equipment to manufacture hollow gypsum building tile. Orville Routt is president of the company.



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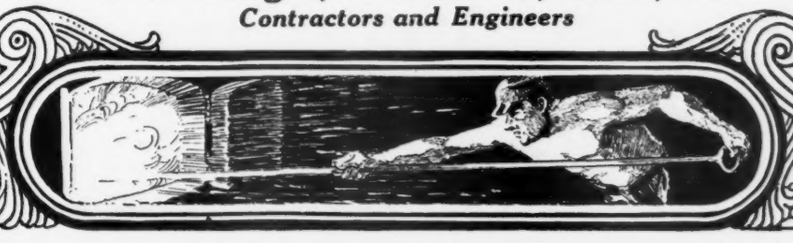

Silica Sand

National Silica and Pumice Co., Meade, Kan., suffered considerable damage by fire at its silica plant two miles west of Meade recently. The plant, valued at $48,000, was insured for $15,000.

Slate

M. L. Tinsman Co., Wind Gap, Penn., sustained a loss of $20,000 when fire destroyed the boiler house at its slate quarry plant. It will be several weeks before operations can be resumed.

Phosphate

Atlantic and Gulf Fertilizer Co., Jacksonville, Fla., recently organized, will erect a new plant to cost about $60,000. C. Nash Reid is president of the company.

Agricultural Limestone

Farmstead Mineral Manufacturing Co., Menno, S. D., has leased property near Menno where a limestone deposit analyzing 95% calcium carbonate was recently located and will develop it, producing agricultural limestone. Adolph Frasch is president and treasurer of the company and I. Charles Souba is secretary.

Personals

Matt M. Bird, representative for the National Lime Association, recently gave an illustrated talk before the San Antonio, Texas, Technical Club on the use of lime in concrete construction.

H. Marette, formerly representative for the Robins Conveying Belt Co. and R. H. Beaumont Co. in the state of Ohio, has been named sales manager for the Variety Iron and Steel Works Co. of Cleveland, Ohio.

James H. Lemon of Milltown, Ind., an employe of the Louisville Cement Co., has been issued a patent by the U. S. Patent Office covering equipment for use in a gas producer system. Patent rights are assigned to the company.

L. I. Crabbe, division production manager of the U. S. Gypsum Co., Chicago, who has been stationed at the Port Clinton, Ohio, plant for the past two years, has been transferred to the Sweetwater, Texas, plant, where he will have charge of operations.

George A. Muir, who for the past five years has been connected with the Denver, Colo., office of the Allis-Chalmers Mfg. Co., and for 10 years previous to that with the machinery department of the Mine and Smelter Supply Co., Denver, has been elected to the office of president and manager of the Advance Machinery and Supply Co. of Denver. The Advance company manufactures patented mechanical stokers and soot blowers and are representatives for a number of concerns, including the De Laval Steam Turbine Co., Trenton, N. J., Yarnall-Waring Co., Philadelphia, Penn., and the Viking Pump Co., Cedar Falls, Iowa.

Manufacturers

Northwest Engineering Co., Chicago, announces the removal of its St. Louis office, in charge of W. B. Jones, to 312 Buder building, St. Louis, Mo.

The Webster Manufacturing Co., Chicago, announces the appointment of L. A. Scheck as manager of its Boston, Mass., sales office at 902 Oliver building.

Richard K. Meade and Co., Baltimore, Md., chemical and industrial engineers, have moved their offices from 11 East Fayette street to the Long building, 10 West Chase street, Baltimore.

Nugent Steel Castings Co., Chicago, manufacturers of small and thin section steel castings, has recently placed in operation an electric annealing furnace for treating their entire product. The installation is said to be unique in that it embodies features of design and heat application not hitherto attempted in the heat treatment of steel castings.

Trade Literature

Gilman Manufacturing Co., East Boston, Mass., has issued accessories bulletin No. 102, which describes the air and water hose, hose fittings and drill steels for Gilman drills.

American Truck and Body Co., Martinsville, Va., has issued a folder descriptive of and illustrating the operation of its demountable bodies for handling concrete brick.

Lewis-Shepard Co., Boston, Mass., has issued its annual pamphlet, "Jacklift and Stacker Practice," showing 33 installations of jacklifts and stackers along with a brief description of each one.

Ruggles-Cole Engineering Co., York, Penn., has issued bulletin No. 22. This bulletin presents very concisely the eight distinct types of Ruggles-Coles dryers. The field of each type is briefly cited.

Walter A. Zelnicker Supply Co., St. Louis, Mo., has issued bulletins Nos. 332-3-4 presenting the equipment handled by the company, including a variety of locomotive cranes, rails, pile driving hammers, cars, pipe and tanks.

Conveyors Corporation of America, Chicago, has issued a booklet on the ash and soot disposal at the Milwaukee, Wis., sewerage plant. It presents a well illustrated description of the "American" conveyor systems installed at this plant.

Westinghouse Electric and Manufacturing Co., East Pittsburgh, Penn., has issued leaflet 1610-E, which gives detailed description of the construction and safety features of its class 10700, type "A" auto-starters for squirrel-cage induction motors.

Orton and Steinbrenner Co., Chicago, now has ready for distribution its new bulletin No. 36, which describes and illustrates type "V" cranes for mounting on motor truck chassis, road wheels, flexible crawling treads and rail wheels.

The Atlas Portland Cement Co., New York, presents a rather attractive booklet in its May-June issue of the "Contractor's Atlas." A number of views of the Washington cathedral, still under construction at Washington, D. C., are given along with details of the construction.

Hardinge county, York, Penn., lists the following bulletins as available to those interested: No. 13, Hardinge conical mill; No. 17, rotary air classifier; No. 21, rock dusting of coal mines; No. 8, metal reclamation; No. 19, batch mills; No. 18, tube mills; No. 20, stone screens; No. 14, pulverized limestone.

E. I. du Pont de Nemours and Co., Inc., Wilmington, Del., in its May Explosives Service Bulletin discusses devices for firing electric detonators other than electric power or lighting circuits. The principles involved and the operation of blasting machines, magnetos and dry cell batteries in electric firing are presented.

Republic Flow Meters Co., Chicago, has issued a pamphlet descriptive of its new pyrometer designed for greater accuracy in reading, dependability in operation, accessibility of parts and low cost for service rendered. The company has also published a new 58-page catalog describing in detail applications, testing, relative readings, maintenance, tables of recommended heat treatments and other such useful data.

The Falk Corporation, Milwaukee, Wis., has had published a new bulletin No. 38 on its Herringbone gear speed reducers. A general description of the reducers, their applications and advantages precedes an individual study of the different types. The text is illustrated with blueprints and photos of the machine and some typical installations. The descriptions are very lucid and the illustrations well chosen and attractively presented.

Gypsum Plaster Board Specification

THE circular of the Bureau of Standards No. 210 has been issued giving U. S. government master specifications for gypsum plaster board. General requirements and methods of inspection and tests are given. Copies of the circular are obtainable from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 5 cents each.

"Quantities of Materials for Concrete"

A SECOND edition of bulletin 9 of the Structural Materials Research Laboratory, Lewis Institute, Chicago, "Quantities of Materials for Concrete," by Duff A. Abrams and Stanton Walker, has been issued.

The principal subject-matter of the bulletin is a series of tables of proportions and quantities for portland cement concrete for compressive strengths of 2000, 2500, 3000, 3500 and 4000 lb. per sq. in. at 28 days, using fine and coarse aggregates of different sizes, and concrete of a wide range of workability as measured by the slump test.

The tables are based on the water-ratio method of proportioning concrete developed in that laboratory as a result of many thousands of tests. They differ principally from tables by other authors in that the proportions have been selected with definite strengths in view, and take into account the quantity of mixing water as well as the size and grading of the fine and coarse aggregates.

This bulletin was first published in 1921, but had been out of print for several months. In the second edition, the text has been rewritten to constitute a more complete discussion of the subject. A method of taking into account the differences in volumes of materials when measured in the laboratory and when measured under field conditions is described. The descriptions of field and laboratory test methods have been enlarged and include recent changes in the standards of the American Society for Testing Materials.

Phosphate Industry Growing in Tahiti Islands

PHOSPHATE rock quarrying is becoming one of the greatest export industries in the islands at Tahiti, it was declared by Orsmond H. Walker, manager of the Papeete branch of the French Oceanic Phosphate Co. at Tahiti, while visiting Salt Lake City, Utah, recently.

Mr. Walker pointed out that while the industry first began in 1907, no shipments were made until 1911, and that exportation had in creased to the extent that in 1924 more than 90,000 tons were shipped to Japan, Hawaii, Spain, Germany and Scandinavia for fertilizer, and that in 1925, the islands expect to ship 150,000 tons.

He said the islands generally are much improve economically since the development of the new industry, and that there are 55,000,000 tons of the rock easily accessible and several times that amount that will require greater effort to mine.

Four hundred Chinese coolies; 150 native islanders and 60 white men as engineers and mechanics are employed.—*Salt Lake City (Utah) Deseret News.*